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Community Assessment of Cardiovascular Health and Risk Among People of Mexican Descent in Berwyn, Illinois

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LOYOLA UNIVERSITY CHICAGO

COMMUNITY ASSESSMENT OF CARDIOVASCULAR HEALTH AND RISK
AMONG PEOPLE OF MEXICAN DESCENT
IN BERWYN, ILLINOIS

A DISSERTATION SUBMITTED TO
THE FACULTY OF THE GRADUATE SCHOOL
IN CANDIDACY FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

PROGRAM IN NURSING

BY

KAREN A. LARIMER

CHICAGO, ILLINOIS

MAY 2011

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ABSTRACT

Background: Cardiovascular disease (CVD) is the number one cause of death in the United States and affects persons of all races and ethnicities. The number of persons of Mexican ethnicity has increased significantly in the United States, notably in the community of Berwyn, a suburb of Chicago, IL where according to the U.S. 2010 census 60% of the community is now of Mexican descent. The factors that contribute to CVD risk in persons of Mexican decent within this community must be understood before culturally appropriate risk reduction strategies are designed and implemented.

Purpose: The purpose of this community-based study is to gain a better understanding of selected social and physical health determinants and risk factors which may contribute to cardiovascular disease in people of Mexican descent in the community of Berwyn.

Methods: The Healthy People 2010 model for assessing a community's health status guided this study. Multiple methods were used to characterize the prevalence of CVD risk factors among a community sample of Berwyn residents of Mexican descent. The impact of the selected social health determinants include language barriers, access to care, cultural behaviors, awareness of CVD and socioeconomic status and physical health determinants such as availability of parks and play lots, grocery stores and environmental pollution. Sources of data included: (1) community health screenings of 106 participants of Mexican descent who were assessed for blood pressure, total cholesterol, glucose, height, weight, body mass index, and age, (2) 15 guided interviews of community key

informants, (3) survey of participants in community/church-based CVD risk screenings, and (4) searches of publicly accessible internet databases related to the social and physical health determinants for this community.

Data Analysis: Guided interviews were analyzed using standard qualitative procedures. STATA/MP version 1.1 was used for descriptive statistical analyses of the survey data and to determine proportions of individuals with abnormal risk values using accepted guidelines for cut-offs. The ARC geographic information system was used to plot locations of parks and stores within the community.

Results: Risk prevalence data gleaned from interviews, in combination with quantitative results, revealed a triad of risk factors in this population. The most common risk factors among the 106 who participated in screenings were high body mass index (45% of the sample as overweight and additional 38% as obese), 52% with low HDL, 44% with elevated glucose, 35% with pre-hypertension; 33% with elevated total cholesterol. Reports from informants suggested that atherogenic diets and lack of physical activity among community members are common. However, key informant and individual community member interviews suggested that CVD does not rank as one of the top overall concerns for this Mexican population. Key informants also believed that lack of access to preventive health care is a common concern, with economic factors creating the greatest barrier to access to health care. The physical health determinants examined revealed that there is availability of stores which sell produce, parks are plentiful and there is an infrastructure to support those parks. However, accessibility to the parks and the quality and size of the parks was variable. Public transportation appeared adequate.

Conclusions: Further in-depth research on each social and physical health determinant and risk factor is necessary to more completely understand CV health and risk in this community. However, this study did provide a snapshot and a starting point for targeted future work. While risk factor prevalence may vary somewhat between geographic location, race and ethnicity in the United States, any variance may not be significant enough to generate targeted interventions. Instead, it may be that social and physical health determinants should be the target for future risk reduction efforts.

Implications for Nursing Practice: Nursing care involves looking at the global picture of health, not only at the individual level, but also at the community level. Nurses are well-suited to study the factors that both contribute to health or increase risk, and ultimately provide strategies for prevention of CVD. The results of this study combined the scientific exploration of cardiovascular health/risk with the philosophical application of community stewardship, which is uniquely nursing based. As the population of people of Mexican descent grows in Berwyn and around the U.S., it is important that nurses be at the forefront to gain a better understanding of the risk factors and health determinants (both social and physical) that may influence cardiovascular health and risk in people of Mexican descent.

CHAPTER ONE

INTRODUCTION

Albert Schweitzer said “I don't know what your destiny will be, but one thing I know: the only ones among you who will be really happy are those who will have sought and found how to serve.” This quote summarizes the satisfaction this author has experienced conducting the work of this dissertation. This research project combines the scientific exploration of cardiovascular health and risk for disease with the philosophical application of community stewardship.

This chapter presents the following topics: definition and discussion of cardiovascular disease (CVD) and its impact in the United States; description of Healthy People 2010 and its use as a conceptual model; a description of risk factors and health determinants that may contribute to CVD; a discussion of CVD in people of Mexican descent; and a description of CVD screening work in the community of interest. Finally, this chapter ends with a discussion of the purposes of this study and related research questions.

Cardiovascular Disease Definition and Impact in the United States

Cardiovascular disease (CVD) is a broad term that describes a range of diseases that affect the heart and blood vessels. CVD includes atherosclerosis, coronary artery disease, heart valve disease, arrhythmia, heart failure, hypertension, shock, endocarditis, diseases of the aorta and its branches, disorders of the peripheral vascular system, and

congenital heart disease (MedicineNet, 2001). For the purpose of this research study CVD will only include hypertension, heart failure, stroke and coronary heart disease (CHD). Inclusive to CHD is acute myocardial infarction, other ischemic heart disease, angina pectoris, and atherosclerotic cardiovascular disease (American Heart Association [AHA], 2008). These specific cardiac diseases are the focus of this project because they are generally recognized as diseases that can be affected through behavior modification. Since 1919, CVD has caused more deaths in the United States than any other single cause or group of causes (AHA, 2008). The most current estimate of cost of CVD and stroke in the U.S. is \$286 billion (2007) (Roger et al., 2011).

Overview of Model Guiding the Study

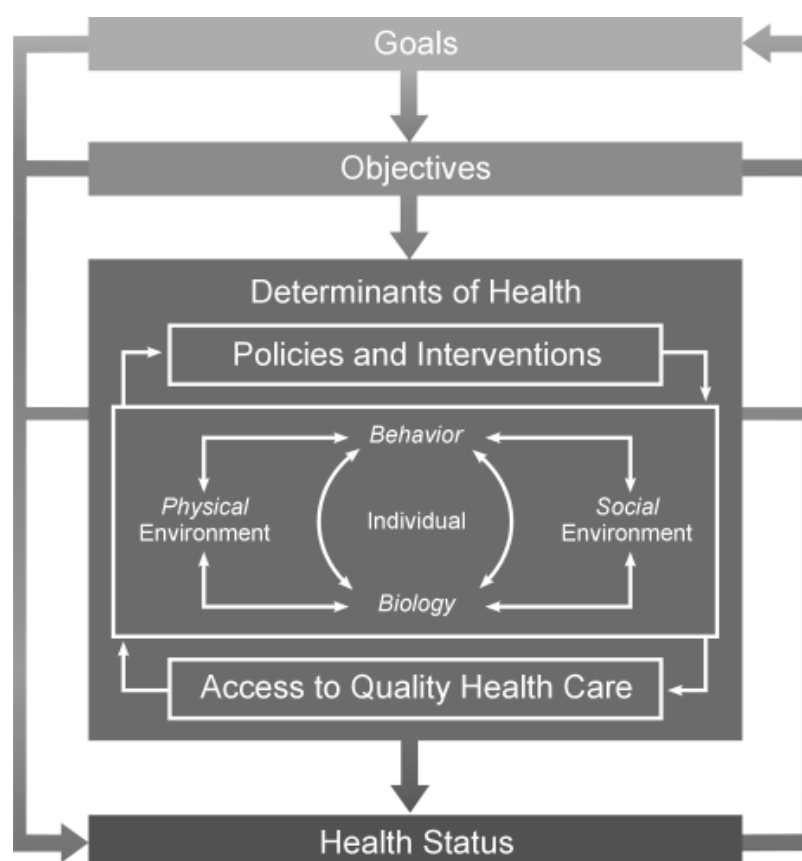
A focus on health promotion and the integration of community, organizations and public policy is critical to cardiovascular risk reduction. According to Dressendorfer, Raine, Dyck, Plotnikoff, Collins-Nakai, McLaughlin et al. (2005), “at the community level, the change process is cultural and social and community engagement (involvement plus action) is the strategy of choice to nurture the development of community capacity” (p. 31). In his work with the Alberta Heart Health Project, Dressendorfer’s early focus was on developing community partnerships. While he derived his own conceptual model of community capacity development, he established an argument for a conceptual model based in community based participatory research. Dressendorfer stresses that “researchers worked with and for the projects with a focus on creating practical knowledge through analysis of the community capacity-building process for action to

move projects forward toward the achievement of health aims through social change” (p. 32).

Similar to Dressendorfer and colleagues’s project, which embraced community capacity building, the Healthy People 2010 Model (see Figure 1) is a model for assessment, development and evaluation of community health programs. This model recognizes that health and health behaviors have multiple causes which must be thoughtfully evaluated a priori to assure appropriate intervention. “Healthy People 2010 presents a comprehensive, nationwide health promotion and disease prevention agenda. It is designed to serve as a roadmap for improving the health of all people in the United States during the first decade of the 21st century” (U.S. Department of Health and Human Services [U.S. DHHS], 2000, p. 1). The goal of Healthy People 2010 is to “increase quality and years of healthy life and eliminate health disparities” (p. 1). The foundation of this model is the relationship between the individual and community. In other words, individual health is linked to community (environment in which individuals live and work) and the community’s health is related to the beliefs, attitudes and behaviors of the individual (U.S. DHHS, 2000). This model recognizes that health and health behaviors have multiple facilitators and barriers. A critical element in the process of understanding these facilitators and barriers is community partnership. Examples of entities which can be considered community partners are agencies of local government, religious organizations, schools, and civic and professional organizations.

In this model these health behaviors have multiple causes which must be evaluated a priori to assure appropriate intervention. To do this the HP2010 work group

determines which areas will receive focus. Goals and objectives are determined and established. Action plans are developed to address benchmarks on a variety of levels. Bench marks are then evaluated. The strength of this model is that it includes an evaluation of not only biologic factors (risk factors) but also the physical and social environment also known as physical and social health determinants. For this research study social and physical health determinants and behavior and biological factors (i.e., risk factors) were examined and evaluated in the community of Berwyn, Illinois.



Note. Adapted from U.S Department of Health and Human Services: Healthy People 2010 (2000): With understanding and improving health and objectives for improving health. Washington, DC: Government Printing Office, p. 2.

Figure 1. Healthy People 2010 Model

The Department of Health and Human Services describes the goals of Healthy People 2010 as about improving health:

Healthy People Healthy People 2010 is about improving health—the health of each individual, the health of communities, and the health of the Nation. However, the Healthy People 2010 goals and objectives cannot by themselves improve the health status of the Nation. Instead, they need to be recognized as part of a larger, systematic approach to health improvement.

This systematic approach to health improvement is composed of four key elements: goals, objectives, determinants of health and health status. Whether this systematic approach is used to improve health on a national level, as in Healthy People 2010, or to organize community action on a particular health issue, such as promoting smoking cessation, the components remain the same. The goals provide a general focus and direction. The goals, in turn, serve as a guide for developing a set of objectives that will measure actual progress within a specified amount of time. The objectives focus on the determinants of health, which encompass the combined effects of individual and community physical and social environments and the policies and interventions used to promote health, prevent disease, and ensure access to quality health care. The ultimate measure of success in any health improvement effort is the health status of the target population. Healthy People 2010 is built on this systematic approach to health improvement. (U.S. DHHS, 2000, p. 7)

While Healthy People 2010 focuses on a spectrum of disease prevention and health promotion areas, the model used in this research focuses specifically on cardiovascular disease. The specific goal for cardiovascular disease in this model is to “improve cardiovascular health and quality of life through the prevention, detection, and treatment of risk factors; early identification and treatment of heart attacks and strokes; and prevention of recurrent cardiovascular events” (U.S. DHHS, 2000, pp. 12-15).

A strength of this model is its focus on gaining an understanding of the social problems as well as the physical problems which affect quality of life of the community from the perspective of the population and the individual stakeholders. The elements of

Healthy People 2010 that are included in this research are the determinants of health that include behavioral and biological risk factors and the social and physical environment.

Behavioral and Biological Factors or Risk Factors

Oleckno (2002) defines “risk factor” as “a behavior, environmental exposure, or inherent human characteristic that is associated with an increased probability of a particular health-related outcome” (p. 352). The Framingham Heart Study was the landmark study that identified the common risk factors or characteristics that contribute to CVD by following a large group of participants over an extended period of time. The study population was monitored for development of overt symptoms of CVD including heart attack and stroke (Kannel, Dawber, Kagan, Revotskie, & Stokes, 1961). Over the years, careful monitoring of the Framingham Study population has led to the identification of major CVD risk factors including high blood pressure, high total cholesterol, smoking, obesity, diabetes, and physical inactivity. The study also generated a great deal of valuable information on the effects of related factors such as blood triglycerides, hypoalphalipoproteinemia (low HDL levels), age, gender, and psychosocial factors (Kannel, 2005).

These risk factors are commonly divided into three categories: modifiable, non-modifiable, and physiologic. Risk factors for CVD considered modifiable through behavior change are physical activity level, diet, alcohol use, and tobacco use. Non-modifiable risk factors are age, family history, gender, and race. Physiologic risk factors are hypertension, obesity, serum lipid level abnormalities and diabetes (Kannel, 2005).

In addition to identifying risk factors for CVD, the Framingham Heart Study provided rich data which supported the National Cholesterol Education Panel in quantifying CVD risk and allowing providers to estimate the probability of future CVD events for individuals through a risk calculation tool. While the Framingham cohort primarily consists of non-Hispanic white subjects, the importance of the major CVD risk factors identified in the Framingham study has been shown in other studies to apply to females and other racial and ethnic groups including Asians, African Americans and Hispanics, although patterns of distribution may vary from group to group (Forouhi & Sattar, 2006; Kurian & Cardarelli, 2007; Mitchell, Hazuda, Haffner, Patterson, & Stern, 1991; Rewers, Shetterly, Hoag, Baxter, Marshall, & Hamman, 1993; Sundquist & Winkleby, 1999).

Determinants of Health

Factors that influence health are health determinants. While the previously identified risk factors can influence the probability of developing CVD, the social and physical environment can also determine health status and may be associated with CVD.

According to the authors of Healthy People 2010, the social environment includes “interactions with family, friends, coworkers, and others in the community” (U.S. DHHS, 2000, p. 19). The social environment also includes institutions such as work, places of worship, and schools. In addition, the state of housing, transportation, and crime are also social environment determinants. “The social environment has a profound effect on individual health, as well as on the health of the larger community, and is unique because of cultural customs; language, and personal religious or spiritual beliefs. At the same

time, individuals and their behaviors contribute to the quality of the social environment” (p. 19).

The physical environment is anything that “can be touched, heard, smelled, and tasted” (U.S. DHHS, 2000, p. 19). Examples of this might be air quality or the presence of sidewalks in a neighborhood. “The physical environment can harm individual and community health, especially when individuals and communities are exposed to toxic substances, irritants, infectious agents, and physical hazards in homes, schools, and worksites. The physical environment also can also promote good health, for example, by providing clean and safe places for people to work, exercise and play” (p. 19). This research project includes a review and evaluation of social and physical environment health determinants affecting CV health in the community of Berwyn, Illinois.

Background on CVD Risk in People of Mexican Descent

Due to recent immigration, there has been a dramatic increase in the Hispanic population, specifically the Mexican population, in the United States. Hispanics are the fastest growing ethnic population in the United States. The U.S. Census Bureau (2000) defines the broader term, “Hispanic,” as persons who trace their ancestry to any primarily Spanish speaking country, regardless of race. The Pew Hispanic Research Center projects that the Hispanic population will reach 60.4 million by 2020 (Pew Hispanic Trust, 2005). “Hispanics will make up 29% of the U.S. population in 2050, compared with 14% in 2005” (Passel & Cohn, 2008, p. i). The growth of the Hispanic population contrasts the stable, but aging, non-Hispanic white and African American populations (Pew Hispanic Trust, 2005). In the United States, the Hispanic population includes

persons from Mexico, Puerto Rico, Cuba, Central and South America, Dominica and Spain. Mexico is the country of origin for the largest group of Hispanics in the United States (U.S. Census Bureau, 2000). Persons of Mexican decent are also the largest minority community in the Chicago metropolitan area (Johnson, 2002). Persons of Mexican descent are often labeled as Mexican, Mexican American, Mexicano or Chicano as well.

Research suggests that adults of Mexican descent experience a similar pattern of CVD morbidity and mortality as non-Hispanic whites. CVD is the number one cause of death of both Mexican Americans (31% in men and 34.4% in women) and non-Hispanic whites (37.2% in men and 35% in women) (AHA, 2008). Mexican Americans have a risk for CVD that is nearly identical to the non-Hispanic white population (Kurian & Cardarelli, 2007).

Risk factors common in non-Hispanic white adults in the U.S. are also prevalent among Hispanic Americans (see Table 1). Approximately 75% of Mexican Americans over the age of 20 are overweight (AHA, 2008). Obesity increases one's risk of developing conditions such as hypertension, diabetes, cardiovascular disease and stroke. Diabetes affects 12% of the Mexican American population greater than 20 years of age (Lloyd-Jones et al., 2010). Sixty-five percent of persons with diabetes die of cardiovascular disease, making diabetes, itself, a "CVD equivalent" (National Diabetes Information Clearinghouse, 2002).

Table 1. Prevalence of Modifiable Risk Factors in Adult Ethnic Groups (United States)

Risk Factor	Non-Hispanic white (%)		Mexican American (%)		African American (%)	
	Male	Female	Male	Female	Male	Female
Hypertension ^{a,f}	32.5	31.9	28.7	31.4	42.6	46.6
Diabetes Mellitus ^{a,f}	6.7	5.6	11	10.9	10.7	13.2
Overweight ^{a,f} (BMI \geq 25.0)	71.0	57.6	74.6	73.0	67.0	79.6
High Cholesterol ^{a,b,f}	47.0	49.7	49.9	50.0	44.8	42.1
Tobacco Use ^{c,g}	24.0	20.0	21.1	11.1	26.7	17.3
Physical Activity ^{d,h}		33.7		22.6 ^e		25.3

Note. Adapted from Heart Disease and Stroke Statistics: 2008 Update At-A-Glance, by American Heart Association, 2008, p.4.

^a Age \geq 20

^b High Cholesterol is total cholesterol \geq 200 mg/dL

^c Age \geq 18

^d Regular leisure-time physical activity is defined as light to moderate activity for \geq 30 minutes, 5 times per week; or vigorous activity for \geq 20 minutes, \geq 3 times per week.

^e Statistic represents Hispanics in general, not only Mexican Americans

^f Data from National Health and Nutrition Examination Survey 1999-2004

^g Data from National Health Interview Survey 2005

^h Data from National Health Interview Survey 2006

Mexican American women have the highest prevalence of no leisure-time physical activity of any group in the United States and only 22.6% of Mexican Americans (men and women) report being physically active (AHA, 2008; Winkleby et al., 1998). In addition, some evidence indicates that Hispanic women develop cardiac

risk factors about 10 years earlier than non-Hispanic white women (Teeters et al., 2007).

Authors suggest that reasons for this finding could be that there was a higher number of prehypertensive persons and less active women in the Hispanic group. However, detailed analysis of this is not available as the paper has yet to be published (Teeters et al., 2001).

There are indications that the prevalence of CVD risk factors is increasing in the general population as well as the Mexican American population (Kurian & Cardarelli, 2007; Mensah, Mokdad, Ford, Greenlund & Croft, 2005). Also, in informal discussions with participants in the earlier work, it appears that behaviors that contribute to CVD risk are common in people of Mexican descent.

Reducing risk for CVD is a national priority (U.S. DHHS, 2000). While most attention has been directed to the non-Hispanic white and African American populations, the growing number of “at risk” people of Mexican descent require health care providers, community leaders and policy makers to focus on the public health implications of the increasing prevalence and incidence of CVD in this population. In order to understand and eventually address the risk factors of CVD in the Hispanic population, it must be recognized that this population has varied ancestry and varying cultural and health beliefs and behaviors. Therefore, the focus of this research is specifically on people of Mexican descent as they are a unique population within the Hispanic population.

Early Work That Served to Ignite the Fire for the Study

This author’s experience began in this community after being awarded an Albert Schweitzer Fellowship in 2006. Through this community service fellowship and in collaboration with the St. Mary of Celle Health Ministry, a CVD risk screening program

called “Health Care Sundays” was founded at St. Mary of Celle Church in Berwyn, Illinois. The Health Care Sundays program involved a team of volunteers performing simple CVD risk assessments such as total cholesterol, blood sugar and blood pressure measurements. Results were immediately available to participants and basic education on modifying CVD risk was provided in Spanish and English. Written material in English and Spanish was distributed with brief counseling in the areas of lifestyle modification and suggestions for follow-up. Referrals were made to local health centers and providers when necessary. It was hoped that by identifying risk factors and providing education individuals might gain a greater awareness of their CVD risk. Organizing and participating in “Health Care Sundays” resulted in a unique opportunity to get to know and work with this predominantly Mexican American, underserved, and vulnerable population.

Participation in the partnership included administrative responsibilities in addition to hands on performance of screenings. Time was also spent working with the clergy of St. Mary of Celle as well as deacons and lay volunteers to facilitate the monthly screening/education program. The author drove a successful initiative integrating bilingual volunteers into the health screenings. An important component of the screening program was that the parishioners learned to do basic screening assessments and learned to run the screenings themselves. Over time, the program became the Health, Education, and Justice Partnership. Its mission is to facilitate health education, focusing on prevention of disease among persons in the Berwyn community and to help eliminate the barriers to health care that people encounter in this underserved community.

A relationship was developed with the Mexican American community and the Health, Education, and Justice Partnership. Invaluable relationships were built and observations made about the high importance of family and community involvement. Also, the community demonstrated an intense willingness to learn and an openness to information provided as well as a desire to be part of the solution to health care problems. After screening over 500 people in this program, the necessity for a scientific assessment of this community's actual risk and needs was clear.

Purpose, Rationale and Assumptions of the Study

The purpose of this study is to enhance understanding of health determinants and risk factors which contribute to health and cardiovascular disease among people of Mexican descent in the community of Berwyn, Illinois. The rationale for the study is to lay the ground work for future interventions to reduce the risk of CVD in this population.

The following is a list of assumptions on which the research is based:

- (1) The Healthy People 2010 paradigm (Determinants of Health) is applicable to people of Mexican descent residing in the United States of America.
- (2) The National Cholesterol Education Program Risk Assessment Tool for Estimating 10-year Risk of Developing Hard CVD (commonly known as the Framingham Risk Calculator) is a valid instrument for assessing CVD risk for people of Mexican descent.
- (3) Modifiable, non-modifiable and physiologic CVD risk factors identified in the general population are also CVD risk factors for people of Mexican descent such as hyperlipidemia, obesity and diabetes.

- (4) There may be unique social and physical determinants that effect CVD risk status among people of Mexican descent.
- (5) Awareness of risk is a precursor to behavioral change.
- (6) It is important to involve the community in the process of research of issues affecting them. Community based participatory research is a model which facilitates community involvement.

Research Questions

The following is a list of research questions that are the aims of this study. The focus of each question is on Berwyn, Illinois. Chapter Three contains a detailed description of the methodologies used to address these questions.

Question 1: Are there social environmental factors that affect knowledge, attitudes, beliefs and health related behaviors related to cardiovascular health/disease among people of Mexican descent?

Question 2: Are there physical environmental factors that affect knowledge, attitudes, beliefs and health related behaviors related to cardiovascular health/disease among people of Mexican descent?

Question 3: Is there a perceived need for interventions in the community to enhance cardiovascular health?

Question 4: What is the prevalence of selected cardiovascular disease risk factors in adults of Mexican descent participating in health screening programs?

Question 5: What is the prevalence of being high, medium or low risk for cardiovascular disease in adults of Mexican descent participating in health screening programs?

Question 6: What association, if any, is there between Framingham risk category and selected social environmental factors among adults of Mexican descent participating in health screening programs?

Summary

Nurses are well suited to study the factors that contribute to health or increase risk and ultimately design and implement strategies for prevention of CVD. Nurses have greater contact with the underserved and the community as a whole than any other group of health professions. Nurses are skilled educators, evaluators, administrators, care givers and providers of emotional support to the community. Nurses are trusted by the general public and viewed as credible resources for information (Berra, Houston-Miller, & Fair, 2006).

Increases in people of Mexican descent in the U.S. and particularly in Berwyn make it increasingly important for nurses to provide culturally sensitive care. If this large segment of the population has adequate preventive cardiovascular health care, it could lessen direct and indirect health care expenditures by a significant amount (DeVol et al., 2007). Thus, gaining a better understanding of the health determinants (both social and physical) and risk factors that may influence cardiovascular health and risk in people of Mexican descent is timely, necessary and important to nursing. The following chapters will review the state of the science on this topic (literature review) and describe the research study including methodology, results and discussion.

CHAPTER TWO

LITERATURE REVIEW

Researchers have demonstrated that adult Mexican Americans experience a similar pattern of CVD morbidity and mortality as non-Hispanic white Americans. Chapter One discussed how known risk factors among adults for CVD are prevalent among people of Mexican descent, and that selected risk factors such as obesity, diabetes, and physical inactivity are more prevalent among adults of Mexican descent in the U.S. compared to non-Hispanic whites and blacks (AHA, 2008; Wei et al., 1996). These risk factors are increasing in both the general population and in people of Mexican descent (Romer & Romero, 2010). Most attention has been directed to the non-Hispanic white and African American populations. However, the growing number of “at risk” Mexican Americans requires health care providers, community leaders and policy makers to focus on the public health implications of the increasing prevalence and incidence of CVD in the Mexican American population. Healthy People 2010 provides a framework for addressing these risks. The foundation of this model is the relationship between the individual and the community. Individual health is linked to community and community health is related to the beliefs, attitudes and health behaviors of the individual (U.S. DHHS, 2000).

Beliefs, attitudes, and behaviors are also known as health determinants and risk factors. This chapter will provide in depth review of the key literature on CVD risk

factors and risk reduction in the general population in the U.S. and for the Mexican American community. Using the Healthy People 2010 framework, research will be reported on the physical and social environmental health determinants that also influence CVD risk and risk reduction efforts in the study population.

Strategy for Review of Literature

A literature review was done using the CINAHL, MEDLINE, and PsychInfo databases to identify studies examining any aspect related to this topic that included the following search terms: Hispanic, Latino/a, or Mexican-American (because these are often used interchangeably) in all combinations with coronary heart disease, heart disease, cardiovascular disease or prevention, risk reduction, risk factor, acculturation, culture, health beliefs, socioeconomic status, and social class. Criteria for the literature search also included publication from 1990 to 2010 in a peer reviewed journal.

Approximately 615 papers resulted from these searches. Papers were eliminated if they were editorials, letters, or published in a foreign language. Studies were also eliminated if they focused specifically on acute disease processes such as myocardial infarction or survival after stroke. Reference lists of major review papers that summarized current literature were examined and, if a source article was not identified in the initial literature review, it was retrieved and analyzed. However, despite the use of broad search terms, most papers were not applicable for analysis due to very small Mexican American or Hispanic representation in the study population or having CVD prevention as a limited sub analysis.

Several papers were identified examining CVD risk factor reduction programs in the general population. However, only three papers were identified focusing on Hispanics and CVD risk reduction programs. There were five large studies found examining risk factor assessment in Hispanics and/or Mexican Americans and numerous papers were published based on these large studies. The research focusing on determinants of health was varied. There were abundant papers found on socioeconomic status (SES), access to care, and use of complimentary/alternative medicine. However, there were very few papers found on awareness of CVD and acculturation and their relationship to CVD and CVD risk factors. The following is a review of the papers pertinent to this research study.

Cardiovascular Disease and Risk Factor Reduction

The topic of CVD risk prevention has been, and continues to be, heavily researched in the non-Hispanic white population. However, comparatively little research has been done on CVD risk prevention in the Mexican American population of the United States. The following is a discussion of the impact of risk factors on cardiovascular health, and the benefits of risk factor reduction presented for the general population first, then as applies to the Mexican American population.

Impact of risk factors

Confirmatory research demonstrates that the presence of risk factors identified in the Framingham Heart Study make a difference in one's risk and life expectancy. In the Multiple Risk Factor Intervention Trial (MRFIT) (N= 361,662), subjects were classified as "low risk" (i.e., serum cholesterol \leq 200 mg/dL, untreated blood pressure \leq 120/ \leq 90

mm Hg, no current smoking, no diabetes, and no major electrocardiographic abnormalities). Subjects were stratified by age and those categorized as “low risk” had lower predicted long-term coronary heart disease (CHD) mortality rates by 86 to 92% for young adults (ages 35- 39) and 77% to 79% for middle aged persons (ages 40-57) compared to those who were not “low risk.” Also, there was a 6-10 year greater life expectancy for those in the “low risk” group. While the population analyzed in this study was greater than 90% white it is believed that similar results would be found in other ethnicities (Stamler et al., 1999).

Differences in lifetime risk and survival between subjects with optimal levels for known risk factors and those with ≥ 2 major risk factors were investigated by Lloyd-Jones et al. (2006). Investigators found that men aged 50 with optimal risk factor profiles had a 5% lifetime risk of CVD compared to those with ≥ 2 major risk factors who had a 69% life time risk of CVD. This trend held true for women, as well, who had an 8% risk compared to 50% risk, respectively.

Within the past 10 years research has focused on the assessment of risk. A tool was developed by the National Cholesterol Education Panel that focused on projection of 10 year risk for cardiac events as a basis for informing the public about the need to engage in needed risk reduction efforts. Based on data from Framingham, one’s risk of heart disease can be calculated by counting the number of points for a variety of risk factors, adding the points, then matching the total score with the scoring numbers that correlate with one’s 10 year risk (see Appendix A). Persons with a 20% or greater risk of

a coronary event in the next ten years should be treated as aggressively as people who already have CHD (The Third Report of the NCEP, 2001).

Later work by Ridker (2007) demonstrated that there are additional risk factors that can be added to the Framingham Risk Calculator for women, known as the Reynolds Risk Score, which will give a better indication of risk. However, a separate tool for various ethnic groups has not yet been developed.

Risk factor reduction is effective

Through the past four decades there has been great focus on acute care management of CVD, but only in this decade has there been a more intense focus on preventive measures including medication and lifestyle modification for risk factor reduction (see Table 2).

The literature is clear that risk factor reduction works. For example, Frick demonstrated a 10% decrease in total cholesterol levels resulting in an estimated 30% reduction in the incidence of CHD in a population of middle aged men (Frick et al., 1987). According to the World Health Organization, one year after quitting smoking, the risk of CHD decreases by 50% relation to those who continue to smoke. In addition, there is consensus worldwide that normalization of blood pressure dramatically reduces the risk of stroke, heart failure, kidney failure, and overall CVD mortality and morbidity, even in the elderly (Medical Research Council Working Party, 1985; SHEP Cooperative Working Group, 1991). It is clear that risk reduction is necessary. One approach to risk reduction is focusing on a broad population or community.

Table 2. Guide to Primary Prevention of Cardiovascular Disease

Risk	Recommendations
Smoking	Assess tobacco use each visit Advise to quit Assess willingness to quit Counsel and develop plan for quitting Refer to cessation program Pharmacotherapy Avoid exposure to secondhand smoke
Hypertension	Promote healthy lifestyle modification Weight reduction Dietary sodium reduction Increase dietary fruits and vegetables low-fat dairy products Moderation of alcohol intake Physical activity Pharmacotherapy
Hypercholesterolemia	Increase dietary fruits and vegetables, low-fat dairy products, grains, legumes, fish and lean meats Add or increase dietary plant stanols Saturated fats < 10 % of calories Eliminate trans fatty acids Increase physical activity Weight reduction Pharmacotherapy
Sedentary lifestyle	Moderate-intensity activities Resistance training Flexibility training
Overweightness	Caloric restriction and/or increased caloric expenditure
Diabetes	Diet Exercise Oral hypoglycemic medication Insulin

Note. Adapted from “AHA Guidelines for Primary Prevention of Cardiovascular Disease and Stroke: 2002 Update: Consensus Panel Guide to Comprehensive Risk Reduction for Adult Patients Without Coronary or Other Atherosclerotic Vascular Diseases,” by T.A. Pearson, S.N. Blair, S.R. Daniels, R.H. Eckel, J.M. Fair, S.P. Fortman, et al. for the American Heart Association Science Advisory and Coordinating Committee, 2002, *Circulation*, 106, p. 390.

Community approaches to risk factor reduction

In the late 1980s three large community based trials demonstrated that risk reduction in a primary prevention setting could occur using a variety of materials with multiple messages, media and target groups (Wilson & Pearson, 2005). The Stanford Five-City Project used a program of social learning theory, a communication-behavior change model, community organization principles, and social marketing methods to deliver an education program targeted at stroke and CHD reduction. Two California cities delivered the program and two did not. The treatment cities consisted primarily of a non-Hispanic white population (non-Hispanic white sample was 68% from Monterey and 89% from Salinas). Subjects in the treatment arm were exposed to an average of 527 educational episodes (an average of 26 hours over 5 years) including mixed media programming (workshops, classes, television, radio, and written material). The comparator groups received no cardiovascular risk reduction interventions. Reductions in smoking (13%), cholesterol (2%), blood pressure (4%) and CHD risk (16%) were demonstrated in the intervention city compared to reduction in the control city (Farquhar et al., 1990).

The Minnesota Heart Health Program was a 13 year project aimed at reducing morbidity and mortality from CHD in whole communities. A program of mass media, community organization, and direct education for risk reduction was delivered in the intervention communities. Three Minnesota communities had paired sites (one with the intervention, one without). Surveys were administered in all communities. While there were approximately 400,000 participants, there is no description of the demographic of

this sample. Although the program showed only an over all modest reduction in risk, both men and women demonstrated increased physical activity (percentage of change not noted by the authors) and women demonstrated decreased smoking (1.4%) (Luepker et al., 1994).

In the Pawtucket Heart Health Program two northeastern communities were paired to determine if CVD risk and CVD incidence would improve after delivery of an educational intervention. Social learning theory was the theoretical foundation of the intervention that involved over 500 community organizations over seven years. The first target of the program was risk factor modification, the second emphasized phases of behavior change and the last dimension focused on community activation. Cross-sectional surveys sampling 1,000 subjects for each community were performed over one year. Due to reduction in some risk factors in the intervention group data demonstrated decreased projected CVD rates (16%) (Carleton, Lasater, Assaf, Feldman, & McKinlay, 1995). Ethnicity of this population is not described in this paper although authors describe the Pawtucket census (1980) as 15.8% foreign born and the comparison city census (1980) as 23.8% foreign born (Carleton et al., 1995).

The Stanford Coronary Risk Intervention Project (SCRIP) demonstrated the powerful effect of case management of risk factors on reduction of clinical coronary events in a group with known coronary disease. The 300 person sample was randomized to a multifactor risk factor reduction program versus usual care (treatment = 155, control = 145). A multidisciplinary team worked with patients to address modifiable risk factors while the control group received usual care. The multidisciplinary team worked with the

intervention group to reach recognized goals for CVD risk reduction. In the intervention group less progression and greater stabilization of plaque was noted in addition to a 46% reduction in clinical coronary events (Haskell et al., 1994).

These community based studies have relatively large sample sizes with interventions that lasted from one year to several years. These characteristics favor adequate “dose” of the intervention, however, results demonstrate small or insignificant improvements. The inclusion of Mexican Americans in these studies was limited, as are studies focused on community-based approaches for treating risk factors. As the Mexican American population increases and becomes more integrated in their communities the use of a community based risk reduction approach for prevention and treatment of cardiac risk factors needs to be explored.

Risk factors in the Mexican American population

It is assumed that Mexican Americans have risk factors and a burden of CVD that is similar to non-Hispanic whites. Several large epidemiologic studies have generated data to support this. The San Antonio Heart Study was a population-based survey of CVD conducted between 1979-1988 in Mexican Americans (n=3,278) and non-Hispanic whites (n=1,863) aged 25 to 64 years. Households were randomly sampled in three neighborhoods representing a stratification of economic status. An algorithm was used to establish participant ethnicity. In this study Mexican American men and women, compared to non-Hispanic whites, had a higher body mass index, central obesity, lower high density lipoproteins and higher triglycerides; in other words, the metabolic syndrome (Mitchell et al., 1991).

The San Luis Valley Diabetes Study (SLVDS) was a population based cohort study of non-diabetic and diabetic Hispanics (n=808) and non-Hispanic white (n=878) residents (adult men and women) of Alamosa and Conejos counties (both men and women). The aim of this study was to define the natural history and risk factors for non-insulin dependent diabetes mellitus (NIDDM) and CVD in this population (Rewers et al. 1993). In addition, researchers sought to determine the prevalence of CHD and mortality due to CHD in this population. The study identified all subjects in the two counties with a diagnosis of diabetes and a stratified, random sample of subjects of Hispanic and non-Hispanic white ethnicity with no history of diabetes. Subjects defined themselves as Hispanic by answering the question “Are you of Spanish/Hispanic origin or descent?” (Rewers et al., 1993).

Baseline assessments conducted from 1984 to 1988 consisted of screening or confirmation of diabetes, hypertension, and/or CHD. Reassessment of health status was done in 1991. Researchers found no evidence for lower incidence, prevalence or mortality due to CHD in Hispanics without diabetes compared to non-Hispanic whites. However, they found a 43% lower incidence in mortality from CHD in Hispanic men with diabetes compared to non-Hispanic white males with diabetes at baseline and a 44% lower incidence at four year follow up. Adjusting for cardiovascular risk factors did not affect this ethnic pattern (Rewers et al., 1993).

While the SLVDS is a widely cited epidemiologic study, the CVD mortality findings for Hispanics are questionable. Researchers conducting the SLVDS examined a diabetic population (CVD equivalent) and found lower mortality rates in Hispanic

diabetic men. While it is likely that the risk factor findings in both studies are valid it could be that lower case fatality in the SLVDS was demonstrated for the following reasons: sick individuals returned to their home country, the documented cause of death competed with CVD as cause of death (i.e. diabetes) or vital statistics were inaccurate. Any, or all, of these reasons could alter the findings of this paper and discredit the idea that Hispanics have worse risk factor profiles but improved mortality compared to non-Hispanic whites.

After review of the SLVDS it is necessary to mention the phenomena of the Hispanic Paradox. This puzzling phenomenon is described as Hispanic Americans having a higher presentation of certain risk factors for CVD but having a lower incidence of CVD than African Americans or non-Hispanic whites. This incongruence of higher risk and lower manifested disease is known as the Hispanic Paradox.

To explain this paradox several hypotheses have been generated: (1) CHD incidence is actually lower in Hispanics, (2) the incidence differs by ancestry or location of the Hispanic population, (3) excess Hispanic case fatality does exist, (4) inconsistency in the ethnic patterns of CHD can be explained by a differential access to care, (5) vital records are less accurate among Hispanics (Hispanics may be less likely to have a social security number or one that is accurate), (6) Hispanics may return to their country of birth after retirement or diagnosis of a fatal illness, and (7) among Hispanic diabetics, competing cause(s) that share CHD risk factors selectively remove Hispanics from risk of CHD, thus explaining the lower CHD risk among Hispanic diabetics (Rewers et al., 1993). Swenson, Trepka, Rewers, Scarbro, Hiatt, and Hamman (2002) reviewed studies

potentially demonstrating the Hispanic Paradox and found that some studies demonstrate a higher CVD morbidity and mortality among Hispanics and others demonstrate a lower morbidity and mortality.

An early attempt to study the Hispanic population in comparison to the non-Hispanic white population with regard to CVD risk is The Corpus Christi Heart Project. This was a prospective population based surveillance program in a community of Mexican Americans (n=785) and non-Hispanic whites (n=862). The goal of the project was to compare the experience of these groups with regard to hospitalizations for MI, case-fatality rates, and recurrence of MI and mortality over the course of long-term follow up. In addition, investigators examined associations between occurrence of events and health care utilization. Researchers found that Mexican Americans had CHD mortality rates equal to or lower than non-Hispanic whites (Goff et al., 1993). Assessment of risk factor prevalence was not the focus of this project, however.

The Multi-Ethnic Study of Atherosclerosis (MESA) is a multi-center prospective observational study designed to examine the early stages of CVD. The study was initiated in 1999 and lasted 10 years with a recruited 6,716 participants (Hispanic = 20%). The goal of this study was to more accurately quantify measures of CVD, optimize the progression of subclinical CVD in different ethnic groups and characterize CVD before clinical diagnosis (Multi-Ethnic Study of Atherosclerosis [MESA], 2007).

The most recent study to examine Mexican Americans and CVD risk factors is the Hispanic Community Health Study/Study of Latinos (HCHS/SOL). This is a multi-center epidemiologic study sponsored by the National Heart, Lung and Blood Institute

examining the Hispanic population to determine the role of acculturation in the prevalence and development of disease and to identify risk factors playing a protective or harmful role in Hispanics. This study has a stratified representation of people from Puerto Rican, Mexican, and Dominican countries of origin. The target population of 16,000 persons of Hispanic origin will be recruited through four Field Centers affiliated with San Diego State University, Northwestern University in Chicago, Albert Einstein College of Medicine in the Bronx area of New York, and the University of Miami. Study participants aged 18-74 years will undergo extensive assessments to determine baseline risk factors. Annual follow-up interviews will be conducted to determine health outcomes of interest including, but not limited to CVD, renal function, pulmonary function, and vision (Hispanic Community Health Study/Study of Latinos, 2007). This study is ongoing.

Epidemiologic studies focusing on the Hispanic population have become more sophisticated through the years. Instead of perceiving Hispanics as a homogeneous population, researchers are now looking at the cultural uniqueness of Spanish speaking people from different countries of origin. More recent studies have a prospective study design instead of relying on questionable vital statistics in a retrospective design. Sample sizes for these epidemiologic studies have also increased. It is hoped that refining the strategies for research in this population is a reflection of greater interest and funding for studying these growing populations and recognition that an assessment of CVD risk is necessary.

Target population for the study

As discussed in Chapter One, Hispanics have an equally high morbidity and mortality rate from CVD when compared to non-Hispanic whites and non-Hispanic blacks. The risks of CVD specific to the Hispanic population is less studied than non-Hispanic whites or blacks. Census findings demonstrate a steadily increasing Hispanic population growth.

Historically, large-scale immigration from Latin America and especially Mexico to the U.S. occurred in the 1970s and surged in the 1990s. In addition to legal immigration, illegal immigration has contributed to overall growth. Demographers estimate the current illegal Mexican American immigration at 11.9 million people (Passel & Cohn, 2008). According to the Pew Hispanic Research Center, “Latino immigrants, most of them young adults in their prime child-bearing years, have proved highly fertile, with birth rates twice as high as those of non-Hispanics. Consequently, Latino population growth in the next few decades will be driven primarily by increases in the second generation” (Pew Hispanic Trust, 2005, p. 72).

As the Mexican American population grows it has become less immigrant based and has dispersed throughout the United States. Most of the Mexican American population is concentrated in border states such as Texas, California and New Mexico, however, large populations of Mexican Americans can be found in Illinois, New York, and New Jersey. Increasing growth of the population has also been noted in Georgia, Nebraska and Washington (Pew Hispanic Trust, 2005).

Cicero and Berwyn are two municipalities in the south west corner of Cook County (Illinois) that have especially large numbers of Mexican Americans. These communities were established in the mid-nineteenth century. Early residents were immigrants from eastern and southern Europe and settled there in the early twentieth century. Due to economic depression in the 1970's many working age adults and families left the area to follow job opportunities. The non-Hispanic white population that did not leave these communities aged in place and by 1990 Cicero and Berwyn had one of the oldest populations in the region (Puente & Cardenas, 2002).

Immigration from Mexico to Cicero and Berwyn began in the 1980s and increased in the 1990s. These towns have one of the largest concentrations of people of Mexican descent in the United States. Both Cicero and Berwyn are viewed as end points for "chain migration". "Chain migration" is when immigrants from a particular town or location follow others from that town to a new city or location. Both suburbs are considered safe places for acculturation and incubators for business start-ups by people of Mexican descent (Ready & Brown-Gort, 2005). It is noted that as families become more established in Cicero they often move to Berwyn because Berwyn tends to be more affluent.

The steep increase in immigration from Mexico fueled an increase in the Latino population of Berwyn from 7.4% in 1990 to 38% in 2000 (Cook County Department of Public Health [CCDPH], 2004). However, it is the consensus from community members that the Mexican American population of Latinos in North Berwyn is approximately 70% (Dalia Rocotello, personal communication, 2008). Generally, this population is young

adults with children. School enrollment in North Berwyn in 2006 was approximately 75% Latino. The most recent data shows Cicero's Latino population number at 72,609 or 87% of the total population and Berwyn's Latino population at 33,676 or 60% of the total population according to the U.S Census (2010). A demographic and socioeconomic description of Latino Chicago focusing on the Berwyn-Cicero communities can be found in Appendix B.

Risk factor reduction in the Mexican American population

The literature review identified only two studies specifically targeting Mexican Americans and CVD risk reduction, primarily using a health behavior modification intervention. This intervention, called The San Diego Family Health Project, was a social learning theory-based educational program. A study by Nader et al. (1989) was a health behavior change program focused on cultural sensitivity by recognizing traditional values, social networks, food preferences and recreational choices targeted low to middle income families (N=206). Families were sent surveys to determine interest in participation. Twenty-six percent of the non-Hispanic whites returned the surveys for participation as compared to 46% of the Mexican Americans (Nader et al., 1989).

The intervention was directed at ethnically homogenous groups of families who received three months of intensive training including group and multi-age, adult/children, classes. The focus of the intervention was information dissemination, problem solving, goal setting, reviewing progress and mutual support and encouragement. At 24 month follow up Mexican Americans in the experimental arm gained significantly more knowledge of the skills required to change dietary and exercise habits ($p=.0003$)

compared to the control group. In addition, Anglo American and Mexican Americans reported improved eating habits on a food frequency index ($p=.0001$ for both) compared to the control group. Significant intervention-control differences were seen in systolic blood pressure lowering (ranging from 2.2 to 3.4 mm/Hg) in all study subgroups. Direct observation of participants in the program at one year suggested sustained physical activity in a structured environment (Nader et al., 1989).

While improvement was seen in these subjects, the sample may have been from a very motivated group of individuals. All adults in the study were parents of students enrolled in an elementary school where the program took place. By being parents, and having children in the program, people could have been more motivated to comply. While compliance in follow up was good (89% at 24 months), it is unknown whether this was sustained beyond that point (Nader et al., 1989).

Interestingly, the authors' note that while the intervention had favorable results in both groups, the Anglo Americans overall did better. Ethnicity and socioeconomic status (SES) were confounding variables (possibly by increased stress or by being a less advantaged population) for which there was no accounting. Curiously, sample sizes for Mexican Americans and Anglo Americans were not reported in this paper or an earlier paper where the study was described in greater detail (Nader, Sallis, Rupp, Atkins, Patterson, & Abramson, 1986). Although food diaries and written material were translated and back translated, these measures may still pose cultural inconsistencies. Paper and pencil interview methods may have also been problematic for the Mexican American group due to culture and lower SES (Nader et al., 1989). One cannot assume

that pedagogy and evaluation are equally effective cross culturally. Although based on the social learning theory, there is no rationale for the dose of the intervention. Without knowing sample sizes and rationale for dosing of the intervention it is difficult to know how effective the intervention may have truly been.

An intervention focused primarily on Hispanic women (74% of sample) was the Arizona Well-Integrated Screening and Evaluation for Women Across the Nation Project (WISEWOMAN) (Staten et al., 2004). Women over the age of 50 (N = 217) were recruited to receive either (1) provider counseling, (2) provider counseling and health education, or (3) provider counseling, health education and community health worker support in a 12 month intervention. While these interventions were administered through the Cervical Cancer Early Detection Program, and not a CVD risk reduction program, researchers found that all participants increased their level of physical activity regardless of randomization group. In addition, the group that also had community health worker support increased their intake of fruits and vegetables. Significantly lower systolic blood pressure was seen in the group with the most aggressive risk factor management. In addition, total cholesterol decreased in the group with a health educator and the group with a health educator and community health worker (Staten et al., 2004). The WISEWOMAN project did include five bilingual community health workers to deliver the intervention; however, it is unknown whether the content of the intervention was culturally specific to Hispanics or Mexican Americans.

In the WISEWOMAN project follow up rate was 67% (Staten et al., 2004). Often follow up rate can be low for studies involving Hispanics, who may be transitory.

However, in the Nader study, follow up was 96% at three months (Nader et al., 1986).

In addition, for low income populations of all ethnic groups, transportation to study visits also poses a problem and can limit study visit follow up. These factors contributed to not reaching targeted sample size in the WISEWOMAN project and the study was, therefore, under powered. Under powering the study for lack of subjects poses significant limitations to detecting statistical significance. As with any study, subject potential for follow up and compliance is a consideration when statistically determining sample size.

A study focusing specifically on the Hispanic population demonstrated that a medication intervention could reduce CVD risk factors. AstraZeneca Pharmaceuticals, the maker of rosuvastatin (Crestor), demonstrated that administration of doses of 10 and 20 mg of rosuvastatin reduced low density lipoprotein (LDL) cholesterol 45% and 50% respectively at six weeks in Hispanic patients (AstraZeneca Pharmaceuticals, 2005). This was the first large scale prospective trial designed to assess the effect of HMG Co-a reductase inhibitors (“statins”) in a Hispanic population. Interestingly, this study is important because it provides empirical evidence that pharmaceutical interventions and risk reduction are effective in Hispanics, without relying on the assumption that an intervention works in Hispanics because it has worked in a non-Hispanic white population.

The study lasted only six weeks so follow up was limited. The national origin of the participants is also unknown. Overall, these studies demonstrate that both behavioral intervention and pharmaceutical intervention can reduce CVD risk in the Hispanic population. They also demonstrate that pharmaceutical therapy can be effective and

provide rapid results where behavioral interventions require a greater amount of time and efficacy can be more challenging to produce. However, the rapidity and efficacy of therapy should not be the only considerations in choosing a treatment. Safety, cost, and compliance should be considered as well.

Determinants of Health

Factors that influence health are often termed “health determinants”. While the previously identified risk factors can influence the probability of developing CVD, the social and physical environment can also determine health status. For the purpose of this literature review social health determinants are limited to health care access; culture and/or acculturation; socioeconomic status (SES) (income and education); community awareness of, and attitude, toward CVD and its risk factors; and language as a barrier to health care. Similarly, the physical health determinants considered for this study are operationalized as availability of stores selling fruits and vegetables; availability of parks and play lots; and the availability of public transportation. In addition, air quality and presence of EPA hazardous sites was evaluated as physical health determinants. This portion of the literature review will focus specifically on Hispanic or Mexican American populations and will highlight selected determinants found to be important in the Mexican American community.

Social Determinants of Health

Access to care. In the document Healthy People 2010 ‘access’ is defined as “the timely use of personal health services to achieve the best possible health outcomes” (U.S. DHHS, 2000, pp. 1-3). With regard to preventive care this includes having adequate

health insurance for preventive services and counseling about health behaviors. Access not only includes financial access but physical access (U.S. DHHS, 2000).

To better understand how income, culture and language affected access to health care in Latinos in Southwestern Pennsylvania, Documet and Sharma (2004) performed a cross sectional study using survey and observation. Response rate was 67% with 87% of the sample interviewed in Spanish. Access was divided into two different dimensions: potential and realized. Potential access referred to the enabling resources for health care utilization such as insurance and a regular source of care. Realized access meant that the services were actually used and the person was satisfied with the use (Documet & Sharma, 2004).

Of 434 subjects sampled (powered at 80%) only 206 interviews were completed. The authors did not explain why less than half of the subjects in the sampling frame were interviewed. However, of this sample, six different geographic areas of participant origin, including Mexico, were represented creating a heterogeneous sample. The authors explained that the diversity of the population would balance the threat of having under sampled; however, diversity may pose another threat as findings may differ depending on nation/culture of origin of the subject.

Income, education and region of birth were all found to be statistically significant in their affect on potential access to health care. Gender was the only variable that was significant for realized access. Women had more frequent visits to the doctor; a common finding in all ethnicities.

Qualitative analysis revealed that participants were dissatisfied with interpreters. Participants also reported a preference for personal and warm relationships with providers and also considered relationships more important than a provider's knowledge. It was found that many low income participants who were dissatisfied with the health care system circumvented it and used a chain of social networks (Documet & Sharma, 2004). Health insurance was also an important variable. Some people went without health insurance because they trusted God. However, respondents also reported they could not afford insurance so it is difficult to know if this was an attempt to rationalize or if they deliberately went without insurance (Documet & Sharma, 2004).

In a sample of 8,432 people (Hispanics=1,120) DeLaet, Shea, and Carrasquillo (2002) examined self-reported receipt of physical examinations and other preventive assessments. All subjects had private insurance coverage. They found that Hispanics were less likely to have a blood pressure or cholesterol level checked compared to non-Hispanic whites regardless of type of insurance coverage and controlling for rates of chronic and severe diseases. The authors theorized that this may be due to non-financial barriers to access to care such as language and cultural differences.

Jurkowski (2006) evaluated this finding further, determining that in Chicago 86% of Mexican Americans reported having their blood pressure checked in the last two years and 33% had their cholesterol level checked in the last two years (compared to Illinois state estimates for residents at 94% and 83% respectively) (Illinois Behavioral Risk Factor Surveillance System, 1999). The sample included only adults (≥ 18 years of age.) While insurance status influenced this finding, a multivariate analysis revealed that it was

not the only factor contributing to this underutilization. Other factors included gender and place of birth (Jurkowski, 2006). Women and people of Mexican descent born in the U.S. were more likely to have health assessments.

In a study assessing perceived health care barriers by Hispanics in Baltimore, participants' comments supported a perception of association between lack of health insurance and poor quality of care (Martinez & Carter-Pokras, 2006). Through focus group discussions, health care providers noted that some Hispanics viewed health insurance "in terms of costs and benefits rather than risks and benefits" (Martinez & Carter-Pokras, 2006, p. 904). In addition to the potential barriers that communication, culture, and finance present, these Hispanics noted other barriers: legal issues (e.g., lack of social security number, illegal immigration status) and logistical issues (e.g., transportation, absence of conveniently located services, waiting for translators) (Martinez & Carter-Pokras, 2006).

Of note, Hispanics have the largest proportion of people who have no health insurance in the U.S. Livingston (2009) looked at Hispanics who were not citizens or legal permanent residents and found that 60% did not have health insurance. This proportion is much higher than the 28% of Hispanics who are legal residents and 17% of the overall U.S. population who do not have health insurance. In addition, Livingston found of those with insurance, 59% reported personally knowing someone who did not have insurance. The Pew Hispanic Center data demonstrated that 63% of Hispanics without health insurance were employed (Pew Hispanic Center, 2004). Foreign born persons and those who are predominantly Spanish speaking were less likely to be insured.

Contributing to the rate of uninsured people is the lower-than-average rate of participation in publicly funded health plans (Pew Hispanic Center, 2004).

Another study examined within the Hispanic/Latino subpopulations (“non-Mexican Latinos” to “Latinos of Mexican ancestry”) and compared health care coverage. Bustamante, Fang, Rizzo and Ortega (2009) drew from the NHIS database (1999-2007, N=33,847) to compare these two groups. Latinos were compared by insurance status using bivariate analysis. Chi-square tests were used to determine associations between being non-Mexican Latino or Latino and health care coverage. Remaining differences in coverage were examined after controlling for confounding socioeconomic and demographic variables.

Differences in health insurance coverage between the two groups were examined. The main dichotomous variable was health insurance coverage. Researchers found that Latinos of Mexican ancestry comprised nearly 70% of the uninsured Latinos in the U.S. in the NHIS database (Bustamante et al., 2009). This finding remained after controlling for confounding variables. However, the observed characteristics of Latinos of Mexican ancestry were that they were more likely to be young, report better health, live in the Western U.S. and be below the poverty line compared to non-Mexican Latinos. Researchers felt that this implied that SES, health status and economic differences explained a large component of disparities in health insurance coverage which was consistent with previous studies (Bustamante et al., 2009).

One conclusion from Bustamante’s study is that those most likely to use health insurance are the ones most likely to have health insurance. Therefore, because those of

Mexican ancestry in this study were younger and healthier they were less likely to have insurance. When looking at SES between those of Mexican ancestry and those not of Mexican ancestry, having a similar SES narrowed the gap between having or not having health insurance. In addition, findings parallel those of Martinez in that it may be that those of Mexican ancestry have less cultural familiarity with the American health care system.

However, the Bustamante study did not capture immigration status and employment status. In the United States being employed often relates directly to having health insurance so it would be important to know if the subjects of Mexican descent were most commonly unemployed and, therefore, over represented as not having health insurance. In addition immigration status was not captured and it could be that more subjects of Mexican ancestry were undocumented immigrants and over represented as not having health insurance.

According to the Pew Report, 22% of Hispanics have trouble paying their medical bills, 15% needed medical care but did not get it, and 20% had to postpone getting medical care for financial reasons (Pew Hispanic Center, 2004). In all three categories there were a higher percentage of uninsured persons that answered positively to these questions compared to insured persons. Unfortunately, in this report, there is no data on the availability of or access to preventive services. More recent data demonstrated that Hispanics remain under insured. Data from the Pew Hispanic Center (2009) demonstrated that between the ages of 18 to 64, 42.7% of Hispanics in the U.S. are uninsured compared to 15.1 of non-Hispanics whites.

After a review of this literature it is evident that lack of health insurance is one factor limiting access to care. However, the literature also demonstrated that there are other barriers to care in addition to lack of health insurance such as language barriers, cultural barriers, gender, place of birth, legal issues and logistical issues. Selected barriers are discussed in following sections.

Culture/acculturation. “The word ‘culture’ implies patterns of human behavior including thoughts, actions, customs, values, and beliefs that can bind a racial, ethnic, religious or social group within a society” (National Alliance for Hispanic Health, 2001, p.10). These patterns or distinctions may facilitate healthy or unhealthy behavior. Some of these distinctions are directly related to health beliefs (folk beliefs) and some distinctions are more indirectly related, such as lack of understanding of the United States health care system. To better understand the facilitators and barriers to healthy or unhealthy behavior, a discussion of cultural health beliefs is necessary.

Beliefs are constructs that lie at the core of culture and are seen as the antecedents of behavior including compliance with health care recommendations (Castro, Furth & Karlow, 1984). To better understand behavior it is necessary to understand these beliefs as determinants of motivation to participate in preventive health programs and to comply with recommended treatments or to abstain from unhealthy practices. This motivation to participate or “comply” occurs when a person believes a treatment is effective and wants to determine the beneficial effect of that treatment (Castro et al., 1984). A summary of common Mexican American folk health beliefs is presented in Table 3. These commonly held health beliefs may or may not influence behavior patterns and effect health risk.

Integration of folk beliefs, health care practices and practitioners. Relationships with health care providers and the interaction of complementary or alternative medicine (CAM) may facilitate, inhibit or have no effect on health behavior and CVD risk. The following is a description of some of commonly held folk beliefs or CAM unique to people of Mexican descent. In the Mexican American culture the *curandero* is a folk or holistic healer and *curanderismo* is the system of folk medicine. *Personalismo* is the tendency to place value on individuals over institutions. In general, Mexican Americans trust and cooperate with individuals they know personally, and many dislike impersonal and formal structures. Another consideration in relationships is *simpatia*, where there is a preference for smooth, conflict free relationships based on warmth and affection. Overt disagreement is not considered appropriate (Spector, 2000).

The Mexican American person may identify a health worker by name rather than by job title or institution. However, *respeto* is also important. The consideration of respect should be shown to elders and figures of authority. The quality of the social interaction is often seen as more important than length of interaction.

Personal space may be close and frequently shared with family members or close friends. Eye contact may be avoided in awkward situations or with persons of authority. Silence may mean failure to understand; however, to avoid conflict it may mean that the person does not agree (Spector, 2000).

Table 3. Mexican Folk Health Beliefs

Belief	Description
hot-cold imbalance	The imbalance of four body fluids or humors is seen as the cause of disease. These are: 1) blood: hot and wet, 2) yellow bile: hot and dry, 3) phlegm: cold and wet, 4) black bile: cold and dry. Understanding the imbalance will direct the remedy for a particular illness. If the illness is cold in origin, then the remedy would be hot. The quality of hot and cold is not related to temperature of the illness or remedy; it is simply descriptive of the substance itself. A substance that may be cold to one person may be hot to another.
witchcraft	A condition caused by the <i>mal ojo</i> or bad eye is a result of excessive admiration. The resulting symptoms are malaise, sleepiness, fatigue and headache. The remedy is finding the person who caused the bad eye and having them care for the ill person.
<i>susto</i>	An illness caused by acute stress, fright, or traumatic event. The underlying pathology is that the person has lost their soul and it is wandering freely. This can occur at anytime and is perceived as the inception of the illness.
<i>curanderismo</i>	The Hispanic folk medical system. Foundations of this system are that mind and body are inseparable. Maintaining balance or harmony in physical, psychological and social realms is key. Treatment is aimed at restoring this balance. The patient is the passive recipient of disease and the cause of these external forces are evil witches. The responsibility for ultimate recovery is shared by the ill person, the family, and the <i>curandero</i> . The natural world is not clearly distinguished from the supernatural world.
<i>curandero</i>	Folk or holistic healer. They are considered to be religious figures. They maintain an informal, friendly, affective relationship with the entire family and are strong social rapport with the family. The <i>curandero</i> has ties to the world of the sacred. Also, this person speaks the same language, lives in the neighborhood and in the same economic condition and understands the lifestyle.

Note. Spector, R. (2000). *Cultural diversity in health and illness* (5th ed.). Prentice Hall. Korzeny, F. & Korzeny, B.A. (2005). *Hispanic marketing: A cultural perspective*. Burlington, MA: Elsevier Butterworth Hennemann.

La familia is critically important in Mexican American culture. Extended families are not unusual. During illness or clinic visits family members are often present. The health care provider may find themselves directing care and instructions to the entire family instead of just to the individual. Interdependence on family and group decision

making is common. In fact, Villarruel and Denyes (1997) reported a higher priority placed on the ability to care for others versus the ability to care for self. This could be perceived as a barrier to preventive care if the individual does not perceive care for themselves as important.

The family is a manifestation of a strong sense of collectivism. Mexican Americans generally think of the family, and groups to which they belong, as essential elements in their lives (Korzenny & Korzenny, 2005). Collectivism is also manifested in spiritual beliefs. Most Mexican Americans are Catholic and have a strong connection to their parish. Priests and church leaders are viewed with *respeto* and are turned to for advice and counsel.

Evaluating the influence of folk beliefs, health care practices and practitioners.

Folk medicine or folk health beliefs are those that are indigenous to a culture. Often these are called “non-Westernized” or not of the biomedical model. Folk or traditional medicine can also be considered complimentary medicine (Castro et al., 1984).

Castro et al. (1984) evaluated the influence that folk medicine has on health care in the Mexican American population. Investigators sought to determine if less acculturated Mexican American women compared to more acculturated women and Anglo American women have a stronger acceptance of specific folk beliefs using the Folk Beliefs Scale. Understanding this would help determine if the level of acculturation and acceptance of certain folk beliefs interfered with the effective use of cognitive-behavioral techniques for health management.

The cultural belief system of 102 women (Mexican American = 62) was evaluated with respect to health care utilization. The Mexican American women were divided into three groups representing three levels of acculturation. Mexican American women at all levels of acculturation had a mild belief in folk beliefs contained in the Folk Beliefs Scale (Castro et al., 1984). All Mexican American women exhibited a relatively stronger acceptance of selected hot-cold theory relationships and there was a statistically significant stronger belief in hot-cold theories with the lower level of acculturation (Castro et al., 1984). In contrast, all women, regardless of acculturation, had a strong acceptance of the concept of cardiovascular risk and stress-illness relationships (Castro et al., 1984). The acceptance of the stress-illness relationship is consistent with the folk belief of *susto* (an illness caused by acute stress, fright, or traumatic event).

These findings demonstrate that Mexican American women have a blended system of belief that may weaken, but does not disappear, with increasing level of acculturation. In addition, “the results tend to rule out interfering or lack of appropriate cognitions as general causes of noncompliance among low acculturation urban Mexican-origin patients” (Castro et al., 1984, p. 380). In addition, low acculturation does not affect acceptance of a biomedical model.

While a lower sense of control was demonstrated by the less acculturated women, they still expressed a comparatively strong sense of personal control and responsibility over their own health (Castro et al., 1984). Additionally, these women also expressed a strong belief in *susto* but not a strong belief in *mal de ojo* or *curanderos*. This would lead one to believe that these women pick and choose their cultural health beliefs and do not

accept all folk beliefs in a universal fashion. Interestingly, Castro's work was supported by Zapata and Shippee-Rice (1999) when they found that a person may use prayer, folk and/or herbal remedies, prescription medications from a friend, and prescription medications from a health care provider simultaneously.

Limitations of Castro's study include a small sample size and the narrow focus mainly on urban women. The findings may be difficult to generalize to women in other settings. In addition, variables that are known to influence a person's compliance with treatment recommendations were not examined. These variables include future time orientation, goal orientation, and availability of social support (Castro et al., 1984).

Health beliefs were looked at by Gordon (1994) using a group interview to elicit "people centered data...to obtain the worldview, attitudes and experience of the people" (p. 311). Hispanic women attending an adult school in a large metropolitan city volunteered as participants in this study. They were asked questions about their common cultural health beliefs as well as other questions to determine what practices were used to prevent illness, how symptoms are initially treated, and who is consulted for advice regarding health. Responses were coded and reduced into categories of home remedies, remedies for common symptoms, and remedies for less common ailments. Data presented dealt mainly with specific treatments and techniques for managing illnesses experienced by children and adults. These remedies were used by the subjects or observed to be used by their parents. However, subjects did not disclose specific conceptual beliefs about health care, prevention of illness or their system for delivering

health care. It is unknown if they did not hold beliefs in the generally recognized models of folk health beliefs or were hesitant to describe those beliefs to researchers.

Limitations of the study include a very small sample size ($N = 11$) and no assessment of acculturation or other established variables that might effect health beliefs, such as socioeconomic status or level of education. In addition, these were views of women only. However, a valuable component of the study was that it was conducted in Spanish which may have elicited more authentic information than a study conducted in English.

Health maintenance and health care seeking behavior were evaluated using focus groups of Mexican American immigrant women ($N=54$) (Garces, Scarinci, & Harrison, 2006). This study was part of a larger study focusing on sociocultural factors associated with cervical cancer screening among Latina immigrants. Advertising for the study was communicated through a variety of media and data was collected from focus groups in multiple community settings (e.g., churches, beauty shops, homes) (Garces et al., 2006). Responses were categorized into positive and negative perceptions, enablers, and nurturers associated with health maintenance and health care seeking. Women tended to engage in unhealthy behavior due to nonstructural barriers such as lack of time, “tradition” and procrastination. With regard to health maintenance they tended to first use alternative/complementary medicine and maintain traditional beliefs (e.g., hot/cold), and then seek medical help if these practices were not effective. However, they did believe that “check ups” were important and could identify that eating well, exercising and refraining from smoking, alcohol, and drugs as behaviors for remaining healthy.

Interestingly, many of the women believed that they did not have control over their own health, attributing this lack of control to what they called “the system” (Garces et al., 2006).

A strength of the study was the use of a qualitative methodology to allow a clearer understanding of how the population conceptualized health and health beliefs. The study also provided insights into structural and non-structural barriers that influence pursuit and attainment of health care. Limitations of this study include a small convenience sample and that data on disease was self-reported. Participants were all immigrants from Mexico which could be seen as a limitation for generalizability to second generation Mexican Americans. However, this author views it as a strength because it is a more specific reflection of Mexican beliefs as opposed to other groups commonly labeled ‘Hispanic.’

Xu and Farrell (2007) looked at non-Hispanic whites, Hispanics, blacks (African-Americans) and “other” races to describe differences in utilization patterns of CAM. Researchers considered visits to providers of the following as CAM: chiropractic, massage, herbal remedies, spiritual healings or prayers, nutritional advice, acupuncture, medication, homeopathy, traditional medicine, biofeedback and hypnosis. The sampling frame for this study was drawn from respondents to the National Interview Health Survey (1996-1998). In this large sample (N=46,673) 10% were Hispanic. Male and female gender was evenly split. Subjects were asked: “During the calendar year, due to health reasons, did you consult someone who provides these types of treatments?” (Xu & Farrell, 2007).

Among the Hispanic population, 53% used only mainstream medicine (MSM) visits and <1% had only CAM visits. This compares to 68% non-Hispanic whites who had only MSM visits and <1% with CAM visits. Interestingly, 44% of Hispanics had neither CAM nor MSM visits and 2% had both.

These findings can be explained by the difference in insurance coverage (72% in Hispanics versus 90% in non-Hispanic whites) that could affect payment and utilization for both services. Moreover, the mean age of the population was young (28 years for Hispanics and 37 years for non-Hispanic whites), so it may not be surprising that fewer services were sought overall. The sample size for this study was large; however, the definition of CAM was vague.

It is not surprising that use of either CAM or MSM would be low among Hispanics who are a young population and can be assumed to be relatively healthy. In addition, the researchers excluded those with chronic diseases. While the authors concluded that use of CAM could be represented by CAM visits, this may not be the case. Often people use a variety of alternative medical practices without employing a practitioner or having an actual visit.

Massage and herbal remedies were the two most common CAM used by Hispanics in this study. The first CAM visit was found to be independent of MSM visits among Hispanics. There was a statistically significant relationship between homeopathy and spiritual healing and MSM visits that was measured by unconditional marginal effects (ME) obtained from the two-part multivariate model where homeopathy and spiritual effects were -1.276 and -0.848, respectively ($p < .05$). This relationship indicated

there may be substitution of CAM for MSM. As noted before, however, overall CAM was used infrequently (Xu & Farrell, 2007). Typical of the general population, the Hispanics in this study were younger, less insured and less educated than the non-Hispanic white sample.

Specifically, the relationship of spiritual healing and perceptions about the medical encounter among Latinos was looked at by Reyes-Ortiz, Rodriquez and Markides (2009). Using a cross sectional design a survey was conducted of 3,728 Latinos (Mexican = 2,371 or 63%) ≥ 18 years of age using the Pew Hispanic/Robert Wood Johnson Foundation Latino Health Survey. The survey was conducted from July 16 to September 23, 2007 among randomly selected Latino adults in the U.S. Interviews were conducted in English (n= 1,320) and Spanish (n=2,639).

Based on the literature three mind-body alternative behaviors and attitudes and one alternative behavior were evaluated. These included praying for healing, asking others to pray for healing, identifying the importance of spiritual healing and consulting a *curandero*. Correlational analyses were done between key health variables (i.e., nativity, self-rated health, SES, depression and diabetes), independent variables (quality of medical care, feelings toward the medical encounter) and the outcomes (the alternative health behaviors). Multivariate weighted logistic regression analyses were conducted to find independent correlates. Odds ratios with 95% confidence intervals were calculated (Reyes-Ortiz et al., 2009).

The sample population was evenly split between genders, a majority were married (64%), and had 12 or more years of education, most (65.2%) had health insurance and

73.7% had a usual source of health care. Looking specifically at *curandero* utilization, subjects were more likely to consult a *curandero* if they felt confused after their last medical visit with a health care provider (OR 1.58 [CI 1.02-2.45]) and less likely to do so if they felt the quality of their last medical visit was high (OR 0.83 [CI 0.70-0.98]). They were also statistically significantly more likely to consult a *curandero* if they were female, Cuban, foreign born or had a lower self-health rating.

Curandero utilization in this study was reported at 5.8%. While 59.9% reported praying to be healed, 48.8% asked others to pray for healing and 69.2 % considered spiritual healing important. An interesting finding was that the younger subjects were more likely to use a *curandero* but less likely to pray or ask other to pray or felt spiritual healing important. Interestingly, use of *curandero* was higher than that typically found in the literature (Reyes-Ortiz et al., 2009). However, the time dependent variable of “ever used” allowed for the largest time range for reported use of a *curandero*. The study was also limited by its cross sectional sample so no causal outcomes could be determined. Nonetheless, it established a presence of CAM in this population.

These studies demonstrate that many Hispanics have a blended system of health beliefs. While there may be health practices that are considered folk beliefs, Hispanics do not disregard the biomedical model. Generally, a blend of the two models is employed. The under representation of folk beliefs in these studies should be tempered with the consideration that many people who embrace these beliefs may not willingly disclose this in a research environment based in the biomedical model.

The Mexican folk belief health system may influence behavior effecting CVD health. It may be due, in part, to a belief in *susto*, that risk reducing health behaviors are not a norm for most Hispanics. Individuals tend not to seek help until they are very ill. In a study by Martinez and Carter-Pokras (2006), focus groups consisting of Hispanic community members did not rate prevention of chronic disease (i.e., hypertension, heart disease and diabetes) as top health concerns. A focus group of health care providers in this same study, however, rated prevention of chronic diseases as a top concern. This study was small in number (N=34) and exploratory in nature, however, it demonstrated the difference between the lay community's priorities and health care providers' priorities and the lack of focus on prevention. This study broaches the issue that "prevention" may not even be conceptualized by Mexican Americans. It could be that the idea of living healthfully (respecting the body, mind and spirit) is seen as a matter of course not a deliberate action of prevention.

This lack of emphasis on preventive behavior may be related to the Mexican American "here and now" orientation, as opposed to future-planning orientation. Locus of control or focusing on luck or fate may contribute to the lack of belief in prevention. This is known as *resignarse* or passive resignation where the person accepts his fate (Castro et al., 1984). However, the concept of self-control (*controlarse*) in the Mexican American community also includes the ability to withstand stress in the face of adversity (*aguantarse*) and cognitive coping (*sobreponerse*) (Castro et al., 1984).

Other examples of heterogeneity of folk beliefs with regard to prevention are found in common Spanish sayings. These sayings support health promotion and illustrate

the considerable status given to risk reducing health behaviors: *La salud es todo o casi todo* (health is everything or almost everything) and *es mejor prevenir que curar* (an ounce of prevention is worth a pound of cure). The challenge for health professionals is to assess the amount of control patients believe they have over their health and to design interventions that build on traditional support systems.

Acculturation. Acculturation is a difficult variable to quantify but an increasingly important construct, nonetheless. Quantifying this variable is critical to understanding its effect (if there is one) on outcomes of specific interventions. Redfield, Linton and Herskovits define acculturation as early as 1936: “acculturation comprehends those phenomena which result when groups of individuals having different cultures come into continuous first-hand contact, with subsequent changes in the original cultural patterns of either or both groups” (p.149). More recently Jurkowski and Johnson (2005) defined acculturation as “the process of adopting the values, beliefs, and behaviors of a dominant culture by a minority group or the modifications of a person’s culture due to contact with another culture” (p. 411). This definition will be used for the purpose of this discussion.

Acculturation impacts individuals at the behavioral, emotional, and cognitive level. Therefore, many dimensions of an individual can be affected, including language, emotion, gender roles, and attitudes toward health and illness, to mention only a few (Cuellar, Arnold, & Maldonado, 1995). Defining attributes of acculturation are described by Page (2006) in a concept analysis paper. These defining attributes are: (a) original cultural identity, (b) exposure to a culture different from one’s own, and (c) changes in the behavioral, affective, and/or cognitive domains of one’s functioning after exposure to

a new culture. Page also describes the antecedents and consequences of acculturation.

Antecedents to acculturation are identifying with one's original culture and a willingness to modify one's original cultural identity and practices. The consequences of acculturation are change or transition.

As a core construct in health research of ethnic groups, acculturation is often viewed as a confounding variable. Matsudaira (2006) describes two major issues in measurement of acculturation: dimensionality and focused changes in cultural domains. Dimensionality can be unidimensional (when individuals relinquish their culture to adopt a new culture) or bidimensional (individuals have selective adoption and retention of their new and original culture, respectively).

Dimensionality has fostered a conceptual model of four acculturation classifications. The first classification is assimilation, where the individual has high contact with the new culture and low maintenance of the old culture. Secondly, the individual has high contact in both cultures and are considered integrated. High maintenance of the old culture and low contact with the new culture are considered separated and those low in both cultures are considered marginalized. The criticism of this model, and scales that measure this model, is that in actuality one may be highly "assimilated" in one part of their culture (i.e., language) but "separate" in another part (i.e., religion). Rarely is a person's level of acculturation achieved in a purely linear transition or is it mutually exclusive. Therefore, by using these classifications to categorize acculturation one may draw inaccurate conclusions.

The second issue in measurement is focused changes. Scales that measure these changes focus on behavior changes in daily life and subjective internal changes such as values. Overt changes are measured by choices including language use, and preferences regarding food, clothing, media and friendship. Internal changes are reflected in values, cultural belief, identity and social affiliation (Matsudaira, 2006). The most frequently studied domain is language. It is believed that language is the best indicator of acculturation and has the greatest impact on patient/health care provider relations (Doty, 2003).

There are different degrees of acculturation in the Mexican American population and it is important to assess this. It is theorized that acculturation, and the degree of acculturation, may influence health behaviors. Due to the nature of immigration this population has varying levels of acculturation. The adoption of new health beliefs and maintenance of previous beliefs may or may not facilitate participation in the biomedical model established in the United States. Assimilating, incorporating and acting on prescribed plans of treatment and recommended health behaviors may be impossible because these are not part of their conceptual model of health.

Acculturation and cardiovascular disease risk. Disease prevalence in relationship to acculturation has been approached by looking at a large variety of diagnoses and circumstances. However, only three papers were found evaluating acculturation and its relationship to cardiovascular disease. The first paper examines a group of Hispanic women and their degree of risk of CVD using the Acculturation Rating Scale for Mexican Americans-II (ARSMA-II) to assess acculturation. This study used a

descriptive correlational design to examine the relationship between CVD risk and anxiety, spirituality, and acculturation in 21 Hispanic women (mean age = 50 years) (Etnyre et al., 2006). Of the 21 Hispanic women, 15 were born in Mexico, two in El Salvador and four in the United States. Because this was a pilot study the sample size was small and thus underpowered. Subjects were recruited from housekeeping staff in a private university in the southwestern United States. The cardiovascular risk factors included weight, blood pressure, lipid and glucose levels. Survey materials were given to subjects for completion and bilingual staff members were available for questions.

The ARSMA-II was completed to assess acculturation. The coefficient alpha for this sample was an $\alpha = .79$ for the Mexican Orientation Subscale and an $\alpha = .88$ for the Anglo Orientation Subscale. It is unknown why the alpha for the Anglo Orientation Subscale was higher. It could be that the alpha of the Anglo Orientation is an accurate reflection of the magnitude of the correlations among items. A scale can be made to look more homogenous by having a greater number of items but that is not the case in this instance. There were more items on the Mexican Orientation Subscale (17) than the Anglo Orientation Subscale (13). Because the alpha of .88 is high it may suggest a high level of item redundancy, however, this is generally an issue with alpha of .90 or greater.

Results showed that most of the women in this study were traditionally Mexican, yet 80% had lived in the United States for greater than 10 years. No correlation was found between level of acculturation and risk factors (blood pressure, weight, glucose, and blood lipids) (Etnyre et al., 2006). However, Etnyre et al. state that “striking findings

were the proportion of women at risk for a cardiac event within 10 years” (p. 126.) This is because subjects demonstrated three or greater risk factors which put them in the moderate risk category using the Framingham Risk Score.

The sample size for this pilot study was very small and it is unknown whether the findings of this study are generalizable to Mexican American men or Hispanics in general. Also, the ARSMA II is specifically an assessment of Mexican American level of acculturation. There is no evidence that this would be a valid measure to those of El Salvadorian origin of which there were two.

The second paper focusing on CVD looked at screening practices in the Mexican American population; these authors devised their own tool for measuring acculturation. A correlational design was used to evaluate the relationship between CVD screening practices and acculturation. Mexican American adults living in Chicago (N=423) were administered a survey asking them about their CVD risk screening behavior (Jurkowski & Johnson, 2005). Three variables were addressed: (1) receipt of routine visit during the past two years; (2) receipt of a blood pressure check by a physician during the past two years; and (3) receipt of blood cholesterol check in the past two years. Surveys were administered by phone in English or Spanish languages (Jurkowski & Johnson, 2005).

The investigators created a three level acculturation index using two variables: place of birth and interview language. If the respondent was interviewed in English and born in the United States they were considered acculturated. If they were Mexican American and participated in the study in Spanish and reported being born outside the U.S. they were considered unacculturated. However, if they were born in the U.S. and

responded in Spanish or born outside the U.S. and responded in English they were considered bicultural. There is no evidence of validation of this scale (Jurkowski & Johnson, 2005).

Based on this measure of acculturation, acculturation was significantly associated with performance of screening behaviors after controlling for sex, education, health care coverage and age. Acculturated Mexican Americans had about four times greater odds of having health care coverage which also contributed to increased rate of screening as did being a woman and age older than 40 (Jurkowski & Johnson, 2005).

Because the design of this study was cross-sectional it could not measure temporal relationships of effects of acculturation, health care coverage or other behavioral variables. A validated acculturation tool was not used to more accurately quantify level of acculturation. The complex issue of “undocumented” status in the United States may have threatened validity of data as well. Undocumented people may be less likely to respond to surveys which could reflect on conclusions about screening behaviors.

Finally, Eamranond (2009) looked at 4,729 Hispanics who participated in NHANES (1999-2004) to understand the association between acculturation and control of low density lipoprotein cholesterol, blood pressure and hemoglobin A1c.

Hispanic adults with low acculturation as measured by the Short Acculturation Scale (a five item scale measuring use of Spanish language, Cronbach’s $\alpha \geq .90$) were significantly more likely to have poorly controlled LDL cholesterol (OR=3.4, CI 95%, 1.2, 9.5). After adjusting for diet and physical activity, the magnitude of the association

increased. Among those with diabetes and hypertension there were no statistically significant associations between measures and acculturation.

Hunt (2005) wrote in a commentary about assessment of culture and acculturation that data interpretation commonly invokes cultural stereotypes about Hispanics to explain health status. However, these studies do not include indicators of specific cultural traits. Researchers generally assume that by knowing a person's ethnicity, nationality, or primary language, their beliefs and behaviors can be inferred. Amaro and de la Torre (2002) echo this criticism by noting that current assessment of acculturation does not explore the complex domain of identity formation, bicultural identity or shifting identity roles.

Socioeconomic status. Socioeconomic status (SES) may be represented by income, level of education or occupation. Most often education and income-related measures are used to measure socioeconomic status (U.S. DHHS, 2000). These authors write that income and education are often proxy measures for each other and, in general, those with the least education and highest poverty rates suffer the lowest health status (U.S. DHHS, 2000). This is evidenced by higher occurrence of illness for those who have less access to medical care, affordable housing and opportunities to engage in health-promoting behaviors (U.S. DHHS, 2000).

Looking specifically at the Hispanic population in Cook County, Illinois, Ready and Brown-Gort (2005) found within Chicago the median income for all households in 2000 was \$52,000 compared to \$44,300 for Latino households. However, more recent data from the Pew Hispanic Trust found that in the state of Illinois the median income for

Hispanics was \$28,333 compared to non-Hispanic whites at \$46,548 and non-Hispanic blacks at \$35,417 (Pew Hispanic Trust, 2007).

In a report produced by the Institute for Latino Studies at the University of Notre Dame, in 1999, Latinos were 27% of all persons in poverty in the Metro Chicago area. In 1999, 16.3% of the Latino population was at or below the poverty level of \$18,979 (Paral, Ready, Chun & Sun, 2004). In 1999, 23% of Hispanics in the U.S. were living in poverty compared to 8% of non-Hispanic whites (Therrien & Ramirez, 2001).

Nationally and locally, the economic profile for Hispanics is worse than that of non-Hispanic whites. It is difficult to directly compare incomes based on these data because different populations are captured at different points in time. At the time this paper was written the 2010 U.S. Census data for annual household income data was not available. However, the trend established is that Hispanics have lower median income overall.

A higher level of educational attainment may improve health status as there is more opportunity to learn about health promoting practices. And, as discussed earlier, level of education can be a proxy for income level which is generally proportional to health status. According to 1996 U.S. Census data of Hispanic adults aged 25 to 64 approximately 45% had 12 years or less of education (U.S. DHHS, 2000).

In 2000 the occupations most commonly held by Latinos were production operation, service industry, and laborers/helpers (for Latinas administrative support) (Ready & Brown-Gort, 2005). Hispanics are more likely to be unemployed and, when employed, they earn less than non-Hispanic white workers. The income level, poverty

status and level of employment may be some of the unique social determinants that could affect CVD health and risk in the Mexican American.

Awareness of CVD risk. Mosca and colleagues demonstrated that having awareness that “CVD is the leading cause of death among women” has been associated with preventive health behavior change which included physical activity, a decrease in unhealthy food and weight loss (Mosca et al., 2006). An assumption of this research is that it is necessary to be aware of risk and have some knowledge of CVD before one can implement behavioral change.

Evaluation of CVD risk knowledge in a group of diabetic patients was assessed using The Heart Disease Facts Questionnaire (HDFQ). This is a 25 item questionnaire that measures knowledge about the relationship between diabetes and heart disease (Wagner, Lacey, Abbott, de Groot, & Chyun, 2006). This tool was administered in English to 678 people (7.2% Latino). Analysis of variance showed significant differences between ethnic groups for HDFQ scores (range=2-25), with Latinos scoring the lowest ($M=18.2$, $SD=4.5$). Non-Hispanic whites scored $M=20.9$ ($SD=3.2$) and African Americans scored $M=19.6$ ($SD=3.2$). While covariates were added to the regression analysis, only “income” accounted for a significant amount of variance $F(1, 462)=9.44$, $p<.01$. However, with the addition of multiple covariates, including “income,” difference in ethnic groups was attenuated but remained significant (Wagner et al., 2006). The greatest proportion of Latinos scored in the bottom 20% of HDFQ scores. After controlling for demographics, socioeconomic status, health care, diabetes and cardiovascular health variables, the difference in scores persisted.

While there was concern about the influence of language on findings, researchers monitored participants to assure comprehension of the HDFQ. In addition, an earlier study tested a Spanish version of the questionnaire and revealed equally low scores among Spanish speaking persons with diabetes ($M=17.7$, $SD=4.9$) (Wagner, Chyun, Lacey, & Abbott, 2005).

Interestingly, the diagnosis of diabetes and the duration of diagnosis had no effect on HDFQ scores. This could mean that while patients were managed for diabetes, education was not effective or existent with regard to CVD. This finding is even more troubling in that diabetes is a CVD equivalent. Knowing that Hispanics have a high prevalence of diabetes, this knowledge deficit has significant clinical implications. Unfortunately, there is no identification of country of origin of these Hispanics.

Wagner et al. (2005) point out that a common limitation found in many studies including theirs of Hispanics is that no formal assessment of language proficiency is performed. Hispanics with English as a second language could have a disadvantage in responding to questionnaires. With regard to diagnostic classification of subjects, another potential flaw is that the diagnosis of diabetes and other medical problems was self-reported. When this information is self-reported it is subject to bias, poor recall and incomplete knowledge.

While limitations were noted in this study, the deliberate effort to approximate the proportion of people with diabetes from representative ethnic groups was a strength. While this favored a more representative sample, there may still be recruitment bias as

motivated individuals, who already know more about their disease, may be more motivated to participate.

Another study that assessed knowledge of CVD was done by the American Heart Association (AHA). In 1997 the AHA launched a campaign focusing on women and heart disease. Surveys were conducted in 1997, 2000, 2003 and 2006 to evaluate awareness, knowledge, and perceptions related to CVD using a standardized interviewer-assisted questionnaire. This study was a cross sectional survey of 1,005 women contacted through random digit dialing. Hispanic women (n=125 or 12%) demonstrated only a 29% awareness of heart disease as the leading cause of death among women compared to non-Hispanic white women (68%, $p<.05$) (Christian, Rosamond, White, & Mosca, 2007). While there were trends toward improvement of knowledge that “CVD is the number one cause of death” in all groups, over the years that the survey was administered the gap between ethnic groups has not narrowed.

While the gap in awareness is troubling, it would be more valuable to know if these women were aware of the causes and risks for CVD. This was answered by assessing their knowledge of heart disease risk factors and strategies for prevention. A majority of women recognized that maintaining healthy blood pressure, maintaining a healthy cholesterol level, exercising, losing weight, reducing stress, quitting smoking, reducing dietary cholesterol, and reducing dietary salt (all methods $\geq 90\%$) were important methods to prevent CVD (Christian et al., 2007). These data have remained unchanged since inception of the survey. However, results were not stratified for ethnicity. While having knowledge that these behaviors may be beneficial to health,

researchers did not assess the subject's ability or willingness to comply with these behaviors.

Perceptions about CVD information delivery were also assessed. Seventeen percent of the Hispanic women felt they were not informed about heart disease. In addition, Hispanic women were more likely than non-Hispanic white women to report that there is nothing they can do to keep themselves from getting CVD (22% vs. 11%, $p < .05$) (Christian et al., 2007).

Dubard, Garrett and Gizlice (2006) asked a similar question about heart attack and stroke knowledge using the 2003 Behavioral Risk Factor Surveillance System (BRFSS) database. These researchers studied language proficiency on awareness of cardiovascular emergency signs and symptoms among Hispanics. Using scores from the Heart Attack and Stroke Module of the BRFSS, which assesses recognition and response to warning symptoms, researchers compared English speaking Hispanics (ESH) ($n=2,847$) and Spanish speaking Hispanics (SSH) ($n=695$) scores. Additional comparison groups were English non-Hispanic whites ($n=21,354$) and English speaking non-Hispanic blacks ($n=2,847$).

Respondents were asked to identify symptoms of heart attack and stroke from a list of symptoms read by an interviewer in the language of their preference. They were then asked about the action they would take if they suspected someone was having a heart attack or stroke. The outcome measure was correctly identifying all five heart attack and all five stroke warning symptoms. Covariates considered were SES, healthcare access, risk factor diagnosis (diabetes, hypertension, high cholesterol obesity),

and health behaviors (smoker, activity, fruits and vegetable consumption) because they were known to potentially influence the outcome variables (Dubard et al., 2006).

Bivariate analysis was conducted to look at associations between the variables and the language categories (ESH and SSH). Analysis was done using t-tests for continuous variables and chi-square tests for dichotomous variables. To look at English proficiency and its independent association with CVD awareness a multiple logistic regression model for each of the five study outcomes was created.

Of the two Hispanic groups the SSH had lower household income, had less than a high school education, less likely to have health insurance, less likely to have a personal healthcare provider, and had foregone needed health care in the year due to cost. Self-reported covariates of risk factor diagnosis did not differ. Findings of the bivariate associations between heart attack knowledge or stroke knowledge was not surprising. Greater knowledge was associated with female gender, higher income, greater access to care as well as the having the clinical cardiovascular risk factors.

Answering the primary research question Dubard et al. (2006) found that only 7% of SSH correctly recognized all five heart attack symptoms compared to 23% of ESH, 28% non-Hispanic black (NHB), and 29% non-Hispanic white (NHW). This trend was also evident with stroke awareness as 61% of SSH responded correctly compared to 83% ESH, 89% of NHB and 94% NHW. After controlling for the previously mentioned bivariate adjusted percentages increased but SSH remained lower than ESH and non-Hispanics.

This study provides evidence that language itself can present a barrier to awareness about CVD. Limitations of this study are that participants self-reported their language abilities. While it is thought that they responded in the language of choice it may be that SSH do speak English. Also, the groups of analysis (SSH, ESH, NHB, NHW) are rough at best. As noted in an earlier discussion grouping all Hispanics together will result in over generalizing results. This may be especially true when attempting to determine differences based on Spanish language which is known to have a variety of dialects. However, the study does bring to light that not only are Hispanics a population that shows lower awareness of CVD but Spanish only speaking Hispanics have even less awareness of CVD. Language as an independent health determinant is discussed in the next section.

These studies demonstrate that there is a void in CVD knowledge among Hispanics. Wagner's study indicates a specific need for CVD education in the diabetic Hispanic population. Christian's study demonstrates a perception by Hispanic women that they are uninformed, despite the ability to recognize risk factors for CVD. Coupled with the fact that Hispanic women develop cardiac risk factors about 10 years earlier than non-Hispanic white women, this poses a significant challenge (Teeters et al., 2007). However, it is unclear if this is really a knowledge deficit or an expression of powerlessness. Language was shown to be a critical variable when examining awareness as demonstrated in Dubard's work.

While other studies have looked at CVD knowledge, risk perception and education level (a possible surrogate for CVD knowledge), none have focused

specifically on the Mexican American population and CVD risk knowledge. Acting under the assumption discussed in Chapter One (awareness of CVD is a precursor to behavioral change) it can be said that that if the individual has no knowledge about the potential risk of CVD, then one can conclude that initiatives for assessing risk may prove difficult. In turn, implementing programs to modify risk and pursuit of behavior modification cannot occur.

Language. “Language is a communication tool by which cultural meaning is transferred and its complexity understood. When understanding language from this perspective it is important to differentiate its layers” (National Alliance for Hispanic Health, 2001, p. 17). As discussed earlier in this paper, language is a significant barrier to health care in the Mexican American population. For many Mexican Americans Spanish is their primary, if not exclusive, language. Even with a cursory knowledge of Spanish it can be difficult for the health care provider to communicate with the non-English speaking person, especially in time of illness. The Robert Wood Johnson Foundation documented that one in five Spanish speaking persons report not seeking health care due to language issues, and nearly eight million Hispanic Americans are not proficient in English (Harvard School of Public Health, 2005).

Princeton Research Associates, on behalf of the Commonwealth Fund, performed a telephone survey in 2001 of 6,722 people considered a nationally representative sample of adults 18 and older. Analysis of the results demonstrated that Hispanics who have limited English proficiency are especially vulnerable to the challenges of accessing medical care and receiving quality health care. Even when insured, primarily Spanish-

speaking Hispanics have a harder time accessing care than do primarily English-speaking Hispanics, non-Hispanic Whites, and non-Hispanic Blacks (Doty, 2003). Hispanics who have limited English proficiency have greater difficulties communicating problems to their doctors. Doty found that 25% of Hispanics with limited English proficiency experienced this problem.

Although both Spanish-speaking and English-speaking Hispanics report difficulties in understanding prescription medicine instructions and material from a doctor's office, Spanish-speaking only Hispanics are at higher disadvantage. Close to 50% of Spanish-speaking only Hispanics report problems understanding instructions for prescription medicine and more than 50% had trouble understanding information distributed from a doctor's office (Doty, 2003). Unfortunately, less than half of Spanish-speaking Hispanics are provided with interpretation services (Doty, 2003). Lack of culturally sensitive services further enhances the barriers that exist to accessing and successfully navigating the health care system.

Little detail is given about the tools, methodology or sample used to create this report. However, most data was drawn from The Commonwealth Fund 2001 Health Care Quality Survey. The particular sample included only ages 18 to 64. This included 2,773 non-Hispanic whites, 885 African Americans, and 1,078 Hispanics. Hispanics were then divided into primarily speaking English (n=691) and primarily speak Spanish (n=387). The determination of language ability was by self-report. The survey was conducted using phone interview which would naturally eliminate people without a phone and may eliminate people who may not answer a phone.

Dubard and Gizlice (2008) looked not only at receipt of health care, as Doty's work did, but specifically at preventive health services. As Dubard and colleagues did in an earlier paper (see Awareness section) they used the BRFSS (2003-2005) to examine self-reported health status, health behaviors, access to care and the use of preventive services of US Hispanics (n=45,076) and the relationship to language preference. Spanish speaking Hispanics (SSH) reported far worse health status and access to care than did English speaking Hispanics (ESH) (39% versus 17% in fair to poor health, 55% versus 23% uninsured, and 58% versus 29% without a personal doctor). When adjusted for SES the influence of language was unchanged (Dubard & Gizlice, 2008).

Specific risk factors were also examined and researchers found that SSHs were more likely to be a current smoker, have less than recommended physical activity, and have no leisure-time physical activity. ESHs were more likely to be obese and to binge drink. All differences were found to be statistically significant. The risk factor of eating less than five daily servings of fruits and vegetables was the same for ESH and SSH.

Although Dubard's study found language-associated disparities, it is a cross-sectional study and looked only at language as a measure of diversity. In this study there was no measure of age, amount of time spent in the U.S., country of origin or language proficiency. In addition, income and employment were not accounted for and these two measures have been shown to strongly attenuate access to care (see Access to Care section of this chapter). The study also does not account for regional differences from state to state.

The work supported by the Commonwealth Fund as well as both of Dubard's papers clearly demonstrate that language can be a barrier to preventive care and disease awareness. A foundation of communication is the spoken word and without patient and provider being able to understand one another's language little information can be given or received. Future work in this population will necessitate interaction being in the language of the participant's choosing.

Physical Determinants of Health

The physical environment is anything that "can be touched, heard, smelled, and tasted" (U.S. DHHS, 2000, p. 19). Examples of this could be air quality or the presence of sidewalks in a neighborhood. "The physical environment can harm individual and community health, especially when individuals and communities are exposed to toxic substances; irritants; infectious agents; and physical hazards in homes, schools, and worksites. The physical environment also can promote good health, for example, by providing clean and safe places for people to work, exercise and play" (U.S. DHHS, 2000, p. 19).

For the purpose of this research five areas considered physical health determinants were examined. The following is a review of the literature focusing on these determinants: stores selling fruits and vegetables, parks, public transportation, toxic waste and air pollution.

Availability of fruits and vegetables. A diet high in fruits and vegetables is a widely accepted component of cardiovascular health. In its consensus statement on primary prevention of CVD the American Heart Association recommends a dietary goal

of “an overall healthy eating pattern” (Pearson et al., 2002, p. 390). The guidelines advocate consumption of fruits and vegetables and substituting foods with trans-fatty acids with healthier options like fruits and vegetables.

Based on the NHANES (2005-2006) 24-hour dietary recalls researchers determined that only 5.9% of Mexican American men and 10.2% Mexican American women met the recommend dietary consumption of fruits (compared to 7.5% and 11.0% for non-Hispanic white men and women respectively and 8.6% and 5.8% for non-Hispanic black men and women respectively). Vegetable consumption was equally as poor as 3.6% of Mexican American men and 4.6% Mexican American women met the recommend dietary consumption (compared to 10.7% and 14.3% for non-Hispanic white men and women respectively and 5.1% and 9.5% for non-Hispanic black men and women respectively) (Lloyd-Jones et al., 2010).

While awareness that eating a diet high in fruits and vegetables is important, the physical health determinant of availability of fruits and vegetables is the focus of this research question. Availability was assessed in 2001 and 2004 in five Chicago neighborhoods (Austin, Hermosa, North Lawndale, Chicago Lawn, and South Chicago). Two different survey programs were conducted but had the shared objective “to document the availability and appeal of fresh fruits and vegetables in neighborhood stores” (Chicago Department of Public Health, 2005, p. 1). One methodology was based on United States Department of Agriculture’s “Community Food Assessment Handbook.” The survey was modified to include food culturally significant to the

neighborhood surveyed. Teams of survey takers (students and community members) went to stores in the neighborhood and documented availability, price and size of items.

A second method used by the Chicago Department of Public Health was the Community Landscape Asset Mapping (CLAM). Using the CLAM, residents were trained to document the types of food stores, the type, variety, quality and prices of fruits and vegetables sold in each store. Also included in the surveys were the availability of low sugar/low fat aisles and availability of nutritional information.

Aggregate findings for the surveyed communities were that of the 178 stores that sold food, greater than one half did not carry fruits or vegetables. Most communities had at least one chain supermarket and these stores were most likely to carry the largest variety and best quality of fruits and vegetables. The majority of stores that sold food (54%) were considered “corner stores.” Of these stores 39% offered no produce and in four communities the produce at these stores received a “poor” or “would not buy” rating. While neither the number nor percentage of people outside a .5 mile radius of a store selling fruits and vegetables was noted, the report did note that there were people living outside this .5 mile radius. The study found this potentially problematic as in the five communities between 21-38% of household do not have vehicles (Chicago Department of Public Health, 2005). The ethnicity of the members of these communities is unknown and no literature exists on the current availability of stores selling fruits and vegetables in Berwyn, Illinois.

Availability of parks. It is assumed that the availability of parks, playlots and green spaces is critical to the promotion of physical activity in a community. The

availability and accessibility of green space as well as its relationship to positive self-reported health status and its benefit to a community has been demonstrated (de Vries, Verheij, Groenewegen, & Spreeuwenberg, 2003; Maas, Verheij, Groenewegen, de Vries, & Spreeuwenberg, 2006; Mitchell & Popham 2008; Verheij, Maas, & Groenewegen, 2008). Green space has been linked to overall health because of its ability to act as a setting for health promoting behaviors such as physical activity and social interaction (Kuo, Sullivan, Coley & Brunson, 1998; Lindsey & Nguyen, 2004). Public parks are an important form of green space that can act as a positive physical health determinant.

Coutts, Horner and Chapin (2010) write that “with the healthful behaviour of physical activity, there is a need for a land use environment and transportation network that support this activity. These “environmental supports” must be in place to support the desired behaviour. A more nuanced consideration of the environmental supports would not only consider their presence or availability, such as measured by acreage of parks or number of trails in a community, but also the quality of these supports reflected by their accessibility” (p. 473).

According to Coutts et al. (2010) the difference between availability and accessibility can be understood with the more familiar contrast between quantity and quality. A higher quantity of environmental supports may increase the availability of green space, but this explains little about their quality reflected in their distribution and subsequent accessibility. Simply having a higher quantity of opportunities available or present in the environment is only one element that can increase the likelihood of a behavior occurring. There may be barriers to accessibility, such as distance to the park or

crime, which preclude taking advantage of that setting.

The presence of green space creates the availability of a venue for physical activity, but the convenience created through access is important to create what Sallis and colleagues (1998) refer to as a 'supportive environment' for activity. It has been shown that persons who reported that they had a place to walk were significantly more likely to meet recommended levels of regular physical activity compared to those reporting they had no place to walk. There was also a direct relationship between the convenience of a place to walk and the proportion of respondents who met current activity recommendations (Powell, Martin, & Chowdhury, 2003). Giles-Corti et al. (2005) confirm that access was the most important consideration in determining use of public open space.

Coutts et al. (2010) note that if individuals have access to green space, parks, or trails they are more likely to active. In both higher and lower income levels and across settings (urban, suburban, rural), persons reporting the presence of walking/jogging trails had a higher likelihood of meeting recommended levels of physical activity (Parks, Housemann, & Brownson, 2003). In another study, 33% of persons that reported having trails use the trails, and, among those using the trails, 42% reported being regularly active (Reed, Ainsworth, Wilson, Mixon, & Cook, 2004). Specific to greenways, a long-term study of multiple greenway systems in Indiana found that at least 70% of users credit the trail with increasing their level of physical activity, and the majority of users fell within the range or exceeded 120-180 minutes of activity per week which was long enough to achieve the recommended dose for moderate level activity (CDC, 2008; Lindsey et al.,

2001).

While it has been shown that adequate green space has positive health effects, to date there has been little attention given to the role of the distribution and accessibility of green spaces on health outcomes, specifically CVD. Only one paper was found focusing on CVD and it did not demonstrate a relationship between availability of green space and cardiovascular health (Richardson, Pearce, Mitchell, Day, & Kingham, 2010).

Richardson did find that those persons of lower SES had less access to usable green space, however. A major caveat of this paper is that the study was conducted in New Zealand where there is “lack of variation of exposure” to green space. Green space in New Zealand tends to be plentiful so there is less of a differential in green space availability. In addition, New Zealand has abundant coast line of where 65% of the population lives within 5 km (Richardson et al., 2010). The combination of lack of green space differential and abundant “blue space” may have contributed to the lack of findings in regard to CVD. With the exception of the Richardson paper it is generally accepted that there is a role in the distribution of green space and accessibility of green space on health outcomes, specifically CVD. However, to this date, there has been little attention given to research in this area.

Adequate public transportation. The Centers for Disease Control and Prevention (CDC) has developed recommendations regarding public transportation. The CDC recognizes that “transportation systems impact quality of life and health” (Centers for Disease Control [CDC], 2010, p. 1). The goal of the CDC’s transportation recommendations is to positively impact health. The focus of these policy

recommendations are to reduce injuries associated with motor vehicle accidents, encourage healthy community design, promote safe and convenient opportunities for physical activity by supporting active transportation infrastructure, reduce human exposure to air pollutants and the adverse effects of exposure to pollutants, and ensure that people have access to safe, healthy, convenient, and affordable transportation.

Providing opportunities for physical activity and reducing air pollutant exposure are two critical elements to decreasing CVD risk. The CDC promotes active transportation (defined as self-propelled, human-powered mode of transportation) like biking and walking can be accomplished by assuring there are well lit sidewalks, safe roadway crossings, and demarcated bike paths on roadways. This could also include a safe and easy link between biking and public transportation, like providing bike racks on buses.

The CDC promotes the use of public transportation because it is believed to improve air quality. Poor air quality is believed to increase morbidity and mortality of CVD and will be discussed further in this chapter. By decreasing the volume of motor vehicles on the roadways there is less fossil fuel combustion and lowered amount of particulate matter emission. In addition, the CDC recommends that buses be retrofitted with air pollution control measures, and that states should incentivize citizens to purchase vehicles with lower emissions (CDC, 2010).

In addition to health and environmental benefits of public transportation the American Public Transportation Association and the Public Transportation Partnership for Tomorrow published a paper citing the health benefits of public transportation.

Authors note that public transportation produces, on average, per passenger mile, between 45-95% less of a variety of air pollutants than private vehicles. Healthcare cost savings was also identified. The authors note that Medicaid and Medicare services pay almost \$3.5 billion a year to provide transportation to non-emergency medical treatment (American Public Transportation Association [APTA], 2003). The authors cite examples in Oklahoma where the Oklahoma Healthcare Authority pays the public transportation system an average of \$2.19 per client per month to operate all non-emergent Medicaid transportation in the state (APTA, 2003). Rhode Island does the same with an operating cost of 45 cents per trip. In Dade County, Florida does the same for Medicaid recipients and has saved the Medicaid program over \$600,000 per month.

Toxic waste. No literature could be found discussing the effect of the presence of toxic waste sites on cardiovascular health. However, there is a paper by Malik and colleagues (2004) demonstrating the link between proximity of waste sites and congenital heart disease. Nonetheless, it is widely accepted that the presence of toxic waste in proximity to water sources can produce negative health effects. The four main offenders are heavy metals which include arsenic, cadmium, lead and mercury. Little research has been done on low level exposure to hazardous substances such as heavy metals which makes it difficult to monitor and evaluate.

Although there has been little research on the effects of toxic waste on CVD risk there has been research on the types of populations that live near these sites. A study by Anderton (1994) identified racial disparity in proximity to toxic waste sites. Using census tracts as the unit of analysis Anderton looked at hazardous-waste sites and

examined the differences in race, class, and economic indicators between the populations in census tracts with treatment, storage, and disposal facilities (TSDFs) and those without TSDFs.

Significant findings of this study were differences in the percentages of the population that were Hispanic (9.4% in census tracts with one or more TSDFs and 7.74% in those with none). They also found that the differences became more noticeable in the areas surrounding the census tracts with TSDFs—that is, tracts with TSDFs and surrounding tracts with at least 50% of their area within a 2.5-mile radius of the center of a tract containing a TSDF. Using this level of analysis, Anderton and colleagues found that populations of the areas surrounding TSDFs have higher mean percentages of African Americans (24.7%, compared with 13.6% in census tracts outside the larger unit of analysis), of Hispanics, (10.7 and 7.3%, respectively), of people with incomes below the poverty level (19.0 and 13.1%, respectively), and of people on welfare (13.3 and 8.3%, respectively).

While it is clear that toxic waste and its proximity to food and water sources is harmful, its relationship to cardiovascular health is unclear. In addition, it is apparent that African Americans and Hispanics are more likely to live near these waste sites. However, there is no literature on the effect of this relationship on their cardiovascular health.

Air quality. The vast majority of research on air pollution has been on fine particulate matter < 2.5 micrometers in aerodynamic diameter (PM_{2.5}). PM_{2.5} is mainly associated with combustion fuel like that found in cars, buses and trains. It is also found

in industrial settings where high temperature processes are present (such as steel mills). The most commonly found secondary gaseous pollutant is ozone (O_3). Ozone also comes from combustible fossil fuels. The gasses produced during combustion combine with hydrocarbons and volatile organic compounds (VOCs) to create ozone or smog. Ozone is thought of as the protective gaseous layer in the upper atmosphere; however, it is harmful at lower levels where humans come into contact with it. $PM_{2.5}$ and ozone also have the longest atmospheric lifetime and can build over multiple days and spread over large geographic areas (Brook et al., 2010).

For $PM_{2.5}$ the US average range of concentration is 5-50 micrograms/meter³ (Brook et al., 2010). The environmental protection agency (EPA) has set the national air quality standard to allow 2% of days during a three year period to exceed 35 micrograms/meter³ before violating the standard. However, the American Lung Association's (ALA) position is that only 1% of days should be allowed. The EPA requires that the annual $PM_{2.5}$ should be below 15 micrograms/meter³. Regardless, there does not appear to be a "safe level" of exposure (State of the Air, 2010b). Ozone's US average range is 0-125 ppb. The EPA considers ozone at ≤ 75 ppb acceptable. However, the ALA has proposed a lower level of 60-70 ppb.

In 2010 the American Heart Association published an update to the consensus statement on particulate matter air pollution and CVD (Brook et al., 2010). The original paper, first published in 2004, established that exposure to air pollution contributes to CV morbidity and mortality. The current paper expands on this and the authors report a causal relationship between $PM_{2.5}$ CV morbidity and mortality and deemed it a

modifiable factor contributing to CV morbidity and mortality. There is evidence that there is a small but consistent association between increased mortality and short term elevations of PM_{2.5}.

Mechanistically it is believed that PM_{2.5} is linked to “endothelial dysfunction and vasoconstriction, increased blood pressure, prothrombotic and coagulant changes, systemic inflammatory and oxidative stress responses, autonomic imbalance and arrhythmias and the progression of atherosclerosis” (Brook et al., 2010, p. 2332) It is believed CV events can be triggered by PM_{2.5} within hours to days after exposure. There is no literature available on ozone’s link to CVD. However, it is assumed that the untoward effects of PM_{2.5} would also be also present with elevated ozone levels.

There are studies that link SES and ethnicity to increased exposure to particulate matter and ozone. The Institute of Medicine’s report of 1999 showed that the proportion of Hispanics living in air-quality non-attainment areas was 34%, for African Americans 16.5%, and for non-Hispanic whites 14.7% (Institute of Medicine, 1999).

Summary

The literature review revealed short comings in the state of the science. First, the majority of research done with respect to CVD has focused on non-Hispanic white males in the United States and not on the Mexican American individual or community (D’Agostino, Grundy, Sullivan, & Wilson, 2001). Currently, in much of the available literature, the Mexican American population is only a small sub-sample of a larger study.

Another criticism is that the research has focused on Hispanics as a homogenous group. Because Hispanic ethnicities and nationalities have not been differentiated (i.e.,

Puerto Ricans, Cubans, Dominicans, Mexican Americans) differences in these ethnicities and nationalities have typically been ignored in the research. In order to address this deficit in the literature, it is necessary to avoid treating Hispanics as a homogeneous population. Because the Mexican American population is large in the United States, and predominant in Chicago, this is an appropriate group with which to initiate prospective research efforts. Focusing on a specific group within the category of “Hispanic” may eliminate threats to validity created by variation in cultural and language differences. The National Institute of Health is attempting to address this void by initiating the “Hispanic Community Health Study-Study of Latinos,” which began in 2008. This multi-site study will attempt to determine some perceptions about health care in a large heterogeneous Hispanic cohort; specifically Mexican American. In an effort to address this gap the focus of this author’s work will also be specifically on the Mexican American population.

The literature focusing on the social environment (access to care, culture and acculturation, SES, knowledge of CVD risk factors, language) is mixed in its strengths and weaknesses. All studies involving knowledge of CV risk were not specifically in the Mexican American population. An additional criticism is that it is unclear if the language in which questionnaires were conducted was in the language or dialect of preference by the participant.

With regard to potentially interfering health beliefs or CAM in the area of CVD risk there is no published work. In the general area of health belief, most work substantiates that there is a blended system of folk health beliefs and belief in the

biomedical model regardless of level of acculturation. However, there is considerable variation in how acculturation was measured. There was no consistent or reliable and valid acculturation instrument used in these studies. In the studies focusing on health belief and acculturation, results were varied with some studies demonstrating a cultural influence and some which did not.

Barriers to CVD risk factor reduction are well documented. While socioeconomic status and lack of access to care have been well studied, there have been very few studies on barriers to CVD prevention behavior. Weinick, Jones, Stone, Ortega, and Burstin (2004) write that “little research to date has endeavored to sort out the role each of these factors plays in contributing to disparities” (p. 313). It is unclear what the influence of SES and access to care is on this specific community so they will be areas of focus in the proposed research. By evaluating these risk factors and health determinants it is hoped that information gleaned from this research will add to the existing body of knowledge.

The literature available focusing on physical health determinants is limited. By far the work regarding availability of fruits and vegetables and healthy eating plans incorporating fruits and vegetables is the most abundant. There has even been some work done in the Chicago area to assess access to adequate and affordable fruits and vegetables. However, research in the area of public transportation, availability of parks and playlots and exposure to toxic waste and air pollution is limited and their relationship to health outcomes, specifically, CVD is virtually non-existent.

While there have been assessments that looked at the Berwyn community in general such as *The State of Latino Chicago: This is Home Now* (Ready & Brown-Gort,

2005) and *Bordering the Mainstream: A Needs Assessment of Latinos in Berwyn and Cicero, Illinois, January 2002* (Puente & Cardenas, 2002), there is little or no information on the physical environment in Berwyn and its relationship to CV health and risk.

CHAPTER THREE

METHODS

The purpose of this study is to gain a better understanding of which risk factors and determinants of health contribute to health and cardiovascular disease among people of Mexican descent in Berwyn, Illinois. The rationale for the study is to lay the ground work for future interventions to reduce the risk of CVD in this population. The following is a review of the research questions and a description of the research methodology used to explore these questions.

Research Questions

Question 1: Are there social environmental factors that effect knowledge, attitudes, beliefs and health related behaviors related to cardiovascular health/disease among people of Mexican descent?

Question 2: Are there physical environmental factors that effect knowledge, attitudes, beliefs and health related behaviors related to cardiovascular health/disease among people of Mexican descent?

Question 3: Is there a perceived need for interventions in the community to enhance cardiovascular health?

Question 4: What is the prevalence of selected cardiovascular disease risk factors in adults of Mexican descent participating in health screening programs?

Question 5: What is the prevalence of being high, medium or low risk for cardiovascular disease in adults of Mexican descent participating in health screening programs?

Question 6: What association, if any, is there between Framingham risk category and selected social environmental factors among adults of Mexican descent participating in health screening programs?

Design

The data gathered to answer the research questions was obtained using three different methodologies. The three methods included: (1) community key informant interviews, (2) database searches, and (3) individual community member surveys and risk factor screening.

Key Informant Interviews

The first method used was a qualitative methodology that included guided interviews. Key informants were asked open-ended questions followed by a series of probes to gain needed information. This method allowed for immediate follow-up and clarification of responses. While this methodology limited the number of persons from which data could be obtained, it is believed that the interviewed key informants had a broad and deep understanding of the scope of the issues sufficient to answer the research questions. This approach allowed the researcher to discover patterns that may contribute to CVD risk and health in people of Mexican descent in this community.

Site

Sample. Participants were identified using criteria that were based on relevance to the research question. These included health care providers (i.e., nurses, doctors),

legislative leaders (i.e., mayor, Berwyn Public Health District president, state congressional representative, community activists), church leaders (i.e., pastors, church staff), and other community leaders that had in depth knowledge of the community were included as possible interviewees. These key informants were then solicited for participation. Participants were also identified by word of mouth from previously identified participants and invited to be interviewed. Criteria for inclusion in interviews included at least one of the following, but not limited to:

1. demonstrated leadership
2. extensively interacts with people of Mexican descent
3. works with an agency that provides services to people of Mexican descent

The number of guided interviews with key informants that was necessary to answer the research question was unknown. A strategy of “chain sampling” was used where qualified interview participants were determined (based on pilot work in the community) and these participants identified other potential interview participants that may have had additional perspectives or information (Marshall & Rossman, 2006). Sampling included an emphasis on diversity of profession, experience, gender, age and ethnicity. Since each stakeholder was recruited to share perspectives from their unique vantage point, data saturation per se was not the goal. Rather, interviews ceased when interview content became repetitive and it was felt by the researcher that no additional information was being collected.

Instrument. Data collection for the community focus primarily occurred through use of a Key Informant Questionnaire (see Appendix C). Questions on this questionnaire

were generated through operational definitions for each domain of social and physical environmental health determinants. There is no reliability or validity data for this particular instrument but face validity was evident.

Procedure. Community key informants were identified as described previously. Once identified solicitation for interviews was first done by postal mail. If no response was returned an email was sent to the potential participant. If no response was returned from the email a phone call was placed.

Once willing participants were identified, a time and location was established for the interviews. Interviews with key informants were conducted at interviewees' offices and other mutually agreeable locations to the interviewer and interviewee. The interview settings were private, quiet areas free of distraction and interruption. In general, interviews occurred in Berwyn, Illinois.

The institutional review board did not require a written consent for these interviews. The interview questionnaire was sent to the interviewee so that, should the interviewee choose, they could consider the questions prior to the interview.

Interviews lasted from 30 to 60 minutes and were conducted in English by the researcher. The researcher was familiar with the community of Berwyn, was a board certified nurse practitioner who understood the health risks of cardiovascular disease, and had prior research experience. Written notes were taken during interviews.

Interview responses were recorded as written notes by the researcher and then formulated into detailed written summaries. If the researcher was unclear about a response after the interview she contacted the interviewee for clarification or elaboration

on their response. After completion of the interview a thank you letter was sent to the participant.

Data analysis. Data analysis for guided interviews followed qualitative procedures, in other words, (1) organizing the data, (2) immersing in the data, (3) generating categories and themes, (4) offering interpretations through analytic memos, (5) searching for alternative understandings, and (6) writing a report of the findings (Marshall & Rossman, 2006).

Organization and immersion in the data occurred by first reviewing written notes. Notes were transcribed into detailed written summaries within 24 hours of the interview. Next, data was reviewed for categories, themes and relationships to types of specific informants. Responses were then summarized into general responses for each separate question based on the key informant questionnaire.

Ethical considerations. The risks involved in participating in this portion of the study were minimal. All research records were stored in locked, limited access areas accessible only to study personnel. There was no expectation of confidentiality as the intent of the interview was to share perspectives and opinions of key informants which could be linked to the participant.

There was no expectation that there would be direct benefit to the participant. However, the researcher did have the ultimate goal of providing an understanding of social and physical health determinants for CV health and risk in Berwyn, Illinois.

Database Search

The next method used to assess social and physical health determinants was a literature search of existing aggregate level data from publically available databases. This method consisted mainly of searches of electronic databases. This method allowed access to publicly available information and, in some cases, privately held information when a release was signed. Limitations of this method are that data may not be always current and, dependent on the source, the validity of the information must be carefully evaluated. However, this data was used to supplement existing data and was verified by other means if in question. This approach allowed the researcher to supplement the community key informant responses and individual community member survey responses with additional data.

Sample. The sample consisted of information on the internet that the researcher assessed to be from a legitimate source.

Procedure. Data was gathered by reviewing websites that were known for housed data pertinent to the research question.

Data analysis. For the majority of this methodology no particular data analysis was required. However, data analysis for parks and grocery stores required a specific method for data analysis. Using Google Maps a search was done using the terms “grocery store Berwyn, Illinois” and “fruits and vegetables Berwyn, Illinois.” Convenience stores (such as 7-Eleven[®]) were not included in the results as their availability of fruits and vegetables is limited and typically expensive. Stores were included in the results if they were located within .25 miles of the border of a surrounding

municipality. While these non-Berwyn stores were not technically located within the city limits of Berwyn they were located on boundary streets and considered accessible to the target population.

Locations of stores were then mapped using ARC geographic information systems (ArcGIS 9.3.1) (Redlands, CA). A one-half mile (generally equal to a 15 minute walk) buffer zone layer was added to the map to demonstrate areas considered “high” access. The buffer zone was based on a Euclidian measure, or straight-line distance, which is widely accepted in the literature. The plotting point used was the exact store address (which is likely the doors). Because no parcel data was available to plot a start point from the center of the parcel the address was used. If the buffer was based on the entire parcel the buffer zone may be slightly different, however, it was felt that the difference was negligible.

In order to assess physical accessibility to areas of recreation the locations of parks, play lots, and activity facilities were mapped. All parks listed by the North Berwyn Park District, Berwyn Park District and Berwyn Recreation Department were mapped. Also included were facilities that provided public access to activity. The same method of mapping and creation of buffer zones that was used for grocery stores was also used for parks.

Ethical considerations. All data acquired was publicly available so there was no risk of loss of confidentiality. If an agency required a waiver to be signed for use of the information this was done. The intention of the waiver is that the information will be used as described to the agency and not for other purposes. Some agencies requested that

the final study report be forwarded to them upon completion and it was agreed that this would occur.

Health Screenings and Surveys

The risk factor screenings and participant surveys were conducted using a mixed methods, cross sectional descriptive design. This allowed evaluation of prevalence of risk factors and health determinants that contribute to CV health or risk among people of Mexican descent attending health screenings in Berwyn, Illinois. Willing participants were also interviewed at the screenings to obtain information about their awareness of and attitudes toward CVD and perceptions of social and physical health determinants. This cross-sectional design was used because it is relatively low cost yet yields rapid results with no “lost to follow up” issues. In addition, this methodology can yield sound data from a small number of subjects.

However, the cross sectional descriptive design did not provide information on prognosis, natural history (temporal sequence) or causation because subjects were not followed in a longitudinal fashion. This design only allowed one to study the presence or absence of disease or risk factor (i.e., prevalence). It could not determine if the variable causes or contributes to being “high risk for CVD.” Finally, this method limited its analysis to only one community of adults of Mexican descent which limits generalizability (Newman, Browner, Cummings, & Hulley, 2001; Oleckno, 2002). Taking into account the benefits and drawbacks of using this methodology, it was thought adequate for determining prevalence and a cost effective method for studying these research questions.

Site. The methodologies included assessment of risk factors at free-standing screenings in Cicero and Berwyn, Illinois which are located in Cook County in the near western municipalities of Chicago, Illinois (see Figure 2). The screenings were sponsored by MacNeal Hospital at St. Mary of Celle in Berwyn, the Catholic Charities and Loyola Health System at St. Frances of Rome in Berwyn, and the Berwyn Public Health District at the Health District annual health fair.



Berwyn, IL: MapQuest (2009). Retrieved July 19, 2009 from <http://www.mapquest.com/maps?city=Berwyn&state=IL>

Figure 2. Location of Berwyn, Illinois

One site for the health screenings was St. Mary of Celle Church in Berwyn, Illinois. The founding of St. Mary of Celle dates back to 1909. The Archbishop set a precedent by establishing a parish where all Catholics regardless of nationalities were welcomed to worship. The ministry of St. Mary of Celle is provided by Roman Catholic diocesan priests and it is the parish home for the Sisters of Christian Charity.

The congregation, in the past, included families of Czech, Polish, German, Irish, French, Croatian, Slovak, and Slovene descent. While this population still exists it is an aging population. Recent years have brought an influx of Mexican families to this area and many have become parish members. St. Mary of Celle serves approximately 1,986 Roman Catholic families and, as of September 2008, had 6,261 members including children and adults (Dalia Rocotello, personal communication, 2008). The parish currently conducts one Spanish language mass each Sunday and delivers services in Spanish and English whenever possible. While there are no records of the exact number of people of Mexican descent that attend St. Mary of Celle Church, the researcher's past experience with this parish established that the Hispanic parishioners are of Mexican descent. Parishioners generally live in that part of Berwyn which is bounded by 12th Street (Roosevelt Road) on the north; 22nd (Cermak Road) on the south; Harlem Avenue on the west; and Ridgeland Avenue on the east. This is considered North Berwyn and is a more economically depressed area than South Berwyn (Dalia Rocotello, personal communication, 2008).

The second site for health screening was the annual health fair sponsored by the Catholic Charities at St. Frances of Rome church and school located at 1401 S. Austin

Blvd., Cicero, Illinois. St. Frances of Rome was founded in 1923. The ministry of St. Frances of Rome is provided by Roman Catholic diocesan priests. Historically, ethnic backgrounds of the parish included Czech, German, Italian, and Lithuanian. Similar to St. Mary of Celle, St. Frances of Rome now has many parishioners of Mexican descent. St. Frances of Rome serves approximately 1,878 Roman Catholic families and, as of September 2008, had 3,808 members including children and adults (Marta Herrera, personal communication, July 16, 2009). The parish currently conducts three Spanish language masses each Sunday. However, there are no records of the exact number of people of Mexican descent that attend St. Frances. Parishioners generally live in that western part of Cicero which is bordered by Berwyn and are of Mexican descent (Dalia Rocotello, personal communication, 2008).

A third site for data collection was the annual health fair held at the Berwyn Public Health District (BPHD). The BPHD is the public health department for the town of Berwyn. Berwyn Township, includes the area bounded on the north by Roosevelt Road, on the south by Pershing Road (39th Street), on the east by Lombard Avenue (west side of the street only), and on the west by Harlem Avenue (east side of the street only). Berwyn Township was established by the Illinois Legislature in 1922 as one of the few coterminous townships in the state. The BPHD was established at the same time. The Township and Public Health District have both been located at 6600 West 26th Street since 1939 (Berwyn Public Health Department, 2010). The BPHD conducts an annual health screening that is opened to the public.

In summary, Berwyn and the two church-based health screening programs (CBHSP) and the BPHD were chosen because of the high percentage of people of Mexican descent living in this area. In order to eliminate the variability that might have occurred when a heterogeneous Hispanic group was studied it was believed that to study a population that was purely of Mexican descent was important. Catholic parishes were chosen because of the ease of capturing a large number of people at a small number of occasions. People of Mexican heritage are largely Catholic and families and adults of all ages generally attend mass. Therefore, it was thought that an even split of genders and representative distribution of ages could be obtained. In addition, previous work, in this area has created strong relationships with St. Mary of Celle Church, the Catholic Charities, and BPHD who were willing to facilitate the research process.

Sample. The sample for the CVD health and risk screenings consisted of adults of Mexican descent, men and women, aged ≥ 20 years to 75 years who were participating in a routine Sunday Health Screening Program, an annual health fair supported by local hospitals or the BPHD annual health fair. Participants were expected to come from the parishes of St. Mary of Celle, St. Frances of Rome, and the general population of Berwyn, Illinois. They met inclusion criteria, were willing to give informed consent to participate, and be able to understand written or verbal English or Spanish. For the church based health screenings a notice was placed in the church bulletin, announcements were made at Sunday masses, and signs were posted in the church rectory introducing the study. Data collection occurred during the routine health screenings held once a month at St. Mary of Celle, the annual health fair at St. Frances of Rome and the BPHD annual

health fair. The sample of participants was solicited from those already participating in these routine screenings.

Inclusion criteria include:

- Being of self-reported Mexican descent (defined as anyone who identifies their origin or ancestry as Mexican/Mexicano, Mexican, or Chicano).
- Being ≥ 20 years ≤ 75 years of age.
- Participating in health screening program.
- Willing to give informed consent to participate.
- Able to understand either spoken or written English or Spanish.

Exclusion criteria include:

- Self-report of being pregnant (pregnancy may alter biologic laboratory measures and hemodynamic measures).

All interested individuals were considered potential participants in the study.

Anyone who met the criteria was able to participate but it was anticipated that it would largely consist of members of the parish where screening was taking place or living in the service area of BPHD.

In order to determine the sample size necessary to accurately calculate prevalence of each risk factor the researcher used the following equation:

Where

p = prevalence of risk factor

RF = risk factor

N = sample

$$p = \frac{\text{number with RF among } N}{N}$$

In order to determine N with a 95% confidence interval, precision was determined using the equation:

$$p \pm \frac{2 \sqrt{p(1-p)}}{\sqrt{N}}$$

The width of the precision interval or $W = \frac{2 \sqrt{p(1-p)}}{\sqrt{N}}$

In order to determine sample size 5% was used as an estimation of W. The best estimation of prevalence (p) was used for the risk factors that were evaluated (see Table 1). This estimation was based on United States statistics for Mexican Americans.

The results of sample size determination ranged from 47 (age as a risk factor) to 400 (total cholesterol as a risk factor). Because a sample of 47 would be insufficient to determine prevalence of other risk factors in this population it was not used. Because total cholesterol, hypertension and LDL cholesterol require sample sizes of 400, 336, and 364, respectively, and total cholesterol and hypertension are major risk factors for CVD, a sample size of 400 could be used using the 5% precision interval.

However, because it was a pilot study and it is the first estimation of risk in this population a wider precision interval was used for the largest sample size (elevated total cholesterol). By using a 7.5% precision width the sample size became 179. Using this sample size the precision width was decreased for measures of age and diabetes mellitus. The other precision widths are increased but not greater than 7.5% (see Table 4). The advantage of using the wider precision width for this risk factor is that it allows a

narrower or more precise width for the variables that had smaller sample sizes at the 5% width. To account for possible drop outs a sample of 200 was obtained.

Table 4. Sample Size Calculation – Health Screenings

Risk Factor	Prevalence			Sample Size	Sample Size	Precision
	Men %	Women %	Average %	W=5%	W=7.5%	(N=179)
Age (\geq 65 years) ^{a,e}	2.4	3.1	2.8	44		2.47
Hypertension ^b	28.7	31.4	30.1	336	150	6.68
Tobacco use ^c	21.1	11.1	16.1	215	96	5.32
Elevated Total Cholesterol ^b cholesterol \geq 200 mg/dL	49.9	50	50	400	179	10.0
HDL < 40 mg/dL ^b	27.7	13	20.4	256	114	5.81
Sedentary/Physical Activity ^d			22.6	283		6.2
LDL >130mg/dL ^b	39.0	30.7	34.9	364	164	7.1
Diabetes Mellitus ^b	11	10.9	11	155	70	4.54
BMI \geq 25 ^b	74.6	73	73.8	308	137	6.4

Note. Adapted from Heart Disease and Stroke Statistics: 2008 Update At-A-Glance, by American Heart Association, 2008, p.4.

^a Statistic represents Hispanics in general, not only Mexican Americans

^b Data from National Health and Nutrition Examination Survey 1999-2004

^c Data from National Health Interview Survey 2005

^d Data from National Health Interview Survey 2006

^e Pew Hispanic Center tabulations of the 2007 American Community Survey

The sample for the screening participant interviews was limited to those willing to participate in the interview. Recruitment for the interview continued for the duration of the screening events. The target number for the interviews was at least 50 which meant approximately 25% of participants at each screening were willing to be interviewed.

Instruments. Instruments used in data collection for questions for physiologic measures such as blood pressure, height and weight, and lipids were collected on the basic screening forms included in the already existing screening programs of MacNeal Hospital, Catholic Charities' health fair and the BPHD (see Appendices D and E).

The basic screening forms used in the existing screening programs contained a variety of parameters to which the researcher had access once the participant signed the study consent form. These data consisted of:

- anthropometric measures (height, weight) assessed using standing scale with stadiometer, measuring tape placed on wall or floor scale.
- blood pressure assessment with subject sitting using automated pressure cuffs (oscillometric method) or manual blood pressure assessment through auscultation measured in millimeters of mercury. The researcher recognized that the Joint National Committee (JNC) recommends the average of several systolic blood pressure measurements is needed for an accurate measure of baseline blood pressure. However, for this study only one resting blood pressure was assessed because it was not feasible to assess sequential blood pressures over time and because there was no treatment based on these blood pressures. The systolic blood pressure value used for the FRC is the one

obtained at the time of assessment, regardless of whether the person is on anti-hypertensive therapy. However, if the person was on antihypertensive treatment, an extra point was added to the FRC beyond points for the systolic blood pressure reading because treated hypertension carries residual risk.

- cholesterol (TChol, LDL, HDL) testing using a finger stick method measured in mg/dL. For the FRC values for total cholesterol and HDL cholesterol are required. Based on the large Framingham research database, its prediction estimates are more robust using total cholesterol instead of LDL cholesterol. It should be noted, however, that the LDL cholesterol level remains the primary target of therapy. The ATP guidelines recommend that total cholesterol and HDL cholesterol values be the average of at least two measurements obtained from lipoprotein analysis. However, in this study only one fasting total cholesterol and HDL cholesterol value was assessed as this is an accepted practice in health screenings (Alan Brown, personal communication, 2008).
- at least a 2 hr fasting blood glucose testing using finger stick method measured in mg/dL. The fasting glucose was self-reported, therefore, no verification of actual fasting status.

Basic demographic data not collected during the individual community member screening events was also collected using the Screening Participant Questionnaire (SPQ). The SPQ was designed by this researcher based on the operational definitions for each domain of social and physical environmental health determinants as well as risk factors.

There is no reliability or validity data for this particular instrument other than face validity.

The SPQ was used to elicit information about awareness of CVD and risk factors, health behavior, health history and community health. The questions on the questionnaire were derived from existing interview tools such as NHIS, NHANES, Lipid Research Clinics Physical Activity Questionnaire and the American Heart Association CVD Awareness (see Appendix F).

The SPQ was translated from English into Spanish by a certified translator. The investigator obtained Institutional Review Board (IRB) approval from the Loyola University Health System and the Catholic Charities.

The data available through the health screening programs' result forms and the SPQ were used in the Framingham Risk Calculator (FRC). The intention of the researcher was to determine risk categories of high, medium and low risk for CVD.

The FRC measures the construct of CVD risk (The Third Report of the National Cholesterol Education Program, Adult Treatment Panel, Executive Summary, 2001). One's 10 year absolute risk of a myocardial infarction and coronary death can be calculated by counting the number of points for a variety of risk factors (age, gender, total cholesterol, HDL-cholesterol, systolic blood pressure and cigarette smoking), adding the points, then matching the total score with the scoring numbers that correlate with one's 10 year risk (see Appendix A). This quantitative score is gender differentiated. Persons with a greater than 20% risk of a coronary event in the next ten years are considered high risk and it is recommended that they be treated as aggressively as people

who already have coronary heart disease (CHD). Because the tool identifies separate risk factors, prevalence of risk factors (such as hypertension) can be determined in this population. Then, based on the resulting risk calculation, individual risk can be calculated as well as prevalence of a group being high risk. This tool is a product of the most recent Adult Treatment Panel III (ATP III) guidelines (see Chapter Two for more information on this tool).

Procedure. Data gathering occurred on the day of the routine Sunday health screenings at St. Mary of Celle, the annual health fairs at St. Frances of Rome and the BPHD. The researcher did not change any part of these established community health screenings. MacNeal Hospital (at St. Mary of Celle Church,) Loyola University Health Systems, other volunteer health care providers, the Catholic Charities (at St. Frances of Rome) and the BPHD were responsible for obtaining the community screening consent forms, for collecting the physiologic measurements, and for managing any abnormal testing results through their own organizational protocols.

At the screening events attendees signed the existing screening program consent forms to participate in the health screening. In addition, they were asked by health screening staff if they were interested in participating in one or both parts of the study. Health screening staff was trained on the purpose of the study and procedure for referring attendees to the study.

Language preference of either Spanish or English was identified and a bilingual volunteer (part of the research staff) presented the consent form in writing and verbally reviewed the written consent form. If the attendee wished to participate they were

allowed to choose between signing the consent form indicating they agreed to researchers' access to their screening results and to participate in the guided interviews using the Study Participant Questionnaire or to release the screening physiologic results alone. Participants were allowed to ask questions. When the participant signed the consent form allowing the researcher access to only their screening physiologic results the study procedures ended at that point. However, if the participant signed the consent form agreeing to participate in the guided interviewing they continued to the interviewing portion.

Once the consent form was reviewed and signed the participant was considered enrolled in the study and the researcher was allowed access to the screening physiologic data and demographic information gathered at the health screening. If the participant also signed the second portion of the consent form the researcher interviewed the participant for additional information about their health perceptions, problems and practices using the Study Participant Questionnaire.

The health screening staff collected all the physiological data during the community screening and was not involved in the research study effort. All health screening attendees rotated through stations that were established to measure physiologic data including: blood pressure, height, weight, blood glucose and cholesterol values. These data were collected on all attendees of the health screening regardless of participation in the study. Physiological data was obtained by the health screening staff at each station and recorded onto the health screening forms. Upon completion of all stations, all attendees (whether participating in the study or not) met with a health

professional and were provided their results with individualized risk factor modification education and literature for cardiovascular risk reduction (e.g., weight loss, dietary modification and smoking cessation) in English or Spanish. This educational session was not part of the study.

If the participant decided to participate in the guided interview they were directed to the researchers. Participants were then read the questions from the Screening Participant Questionnaire (see Appendix F) in the language of their choice and data was recorded by the researcher. Completion of the questionnaire took approximately 30 minutes. A master list of study participants was developed to assure appropriate consent for IRB compliance. A unique study subject number identified was assigned to the two data collection tools (physiologic data collection forms and the Study Participant Questionnaire). These forms were placed in a secured container.

Interviewers consisted of volunteer nursing students, community health workers and medical students. They met the ethics requirements of Loyola University Health Systems IRB, were fluent in either English or Spanish and English, and received orientation to the questionnaire and interviewing techniques.

Data analysis. Baseline demographics and clinical variables, including relevant descriptors from the screening forms including risk factors, were summarized for the cohort of patients enrolled in this study. Descriptive summaries of the distribution of continuous variables were presented in terms of mean, standard deviation, range, and proportions. Discrete variables were summarized in terms of frequencies and

percentages. Summary statistics were analyzed by gender. Fisher's exact test was used to compare smokers to non smokers by gender.

Prevalence of high, medium and low categorization of CVD risk based on the Framingham Risk Scale was calculated by score individual results using the scale and categorizing the absolute risk results into three ranges. STATA/MP version 11.1 (College Station, TX) was used for all calculations.

While the overall community assessment captured social and physical health determinants for Berwyn only, the screening sample for risk factor variables alone included participants from the neighboring municipality of Cicero. It was believed that this would not influence the results of the summary or descriptive statistics.

Data analysis for individual community member surveys included (1) organizing the data, (2) immersing in the data, (3) generating categories and themes, and (4) writing a report of the findings (Marshall & Rossman, 2006). It was not necessary to offer interpretations of findings or alternative understandings because the survey responses were not narrative. Responses were collated and organized in categories based on the survey questions

The data available through the health screening programs' result forms and the SPQ were used in the FRC. Then, based on the resulting risk calculation, individual risk could be calculated as well as prevalence of a group being high, medium or low risk (see data analysis). This was stratified as >20%, 10-20%, 0-9% 10 year absolute risk of myocardial infarction of CVD death.

In the process of gathering data required for completion of the FRC (total cholesterol, blood pressure [treated or untreated], age, smoking history, and HDL) it became clear that certain variables would be difficult to obtain using the strategies employed. As discussed earlier, medical history of diabetes was not obtained. In addition, history of hypertension and tobacco use was not obtained for most subjects.

The main variable that was not obtained was if the subject was “treated” or “untreated” for hypertension. While blood pressure measurements were obtained and able to be stratified into risk levels, most individuals did not complete the individual community member questionnaire, therefore, it could not be determined if the blood pressure was “treated” or “untreated”.

The variable of smoking status was also not obtained in sufficient numbers because most individuals did not complete the individual community member questionnaire. Some individuals did, however, volunteer this information without completing the questionnaire.

The other variable that was not obtained in sufficient numbers to determine a Framingham risk score was HDL. In most cases the reason was that community health screenings typically did not include HDL in their cholesterol assays. While health screenings conducted in the past at St. Mary of Celle had frequently included HDL, it was found at other community health screenings the HDL assay is not done. It was found that in order to do the HDL screening a different (more expensive) strip for the Cholestech LDX[®] or Cadiocheck[®] cholesterol machines is required. Because of this

added expense most health screenings were not able to offer HDL results. All screenings included LDL but this is not a component of the FRC.

Ethical considerations. In conducting the screenings attention to protection of this vulnerable population was paramount. Therefore, several strategies were employed to protect participants. General information about the study was introduced to the potential study population through parish priests, church leaders, and church bulletins as previously discussed. Recognizing the authoritative and potentially coercive role of church staff may have on the potential participants, a simply worded invitation/announcement was used (see Appendix E) stating that parishioners have an opportunity to participate in the study. These monthly screenings and health fairs were a familiar service to each parish. A consent form was reviewed with the participant, in either Spanish or English, and all questions were answered by the research staff on site.

The risks involved in participating in this study were minimal. There was the possibility of confidential information being viewed by people other than study personnel and clinic staff. In order to protect subject privacy several steps were performed. Upon signing the consent form an enrollment number was assigned to the participant and the participant was only identified by this number. The consent form was stored separately from data collection documents. The enrollment number was neither derived from nor related to the individual participants in any way. Furthermore, all research records were stored in locked, limited access areas accessible only to study personnel. After each screening event completed forms were placed in a secured container and transported to a secure location by the researcher. Only these enrollment numbers were used in all data

entry programs and they were password restricted. All data was de-identified for analysis and publication.

A list linking the participant names with the enrollment number was stored at the research office under double locks (cabinet and door), separate from all other research records. The participant list was accessible only to the researcher and study personnel. Study participants were asked to consent to the use of their coded clinical information as part of this research study.

There was no expectation that there would be direct benefit to the participant. However, the researchers did have the ultimate goal of providing an understanding of this population's beliefs, knowledge, and understanding of cardiovascular health and risk.

Summary

Key informant interviews, database searches, and community health screenings with individual interviews provided a mixed methods design to develop a picture of cardiovascular health and risk in the studied community. Each method had advantages and disadvantages which will be discussed in detail in Chapter Five. The primary advantage of the mixed methods design was that the research questions could be approached using different angles, thereby, providing results from varied perspectives (community key informant, individual community member). The disadvantage or limitation of this approach was the inability to focus greater attention on any one method. For example, during the health screenings insufficient risk factor data was able to be gathered (i.e., sample size of key lab values) to make Framingham Risk Score and health

determinant associations. However, it is believed that abundant valuable data was gathered to offset this limitation and it will be discussed in the next chapter.

CHAPTER FOUR

RESULTS

Social and physical health determinants influence health status and may be associated with cardiovascular disease (CVD). The research includes a review and evaluation of social and physical health determinants possibly affecting CVD in Berwyn, Illinois, a community where a majority of the population is of Mexican descent. Social health determinants such as language barriers, access to care, cultural behaviors, awareness of CVD and socioeconomic status (SES) were evaluated. Physical health determinants including the availability of parks and play lots, grocery stores and environmental pollution were also evaluated.

This chapter focuses on evaluation of social and physical health determinants from a community perspective using key informant interviews and individual community member surveys conducted during CVD risk screenings, combined with searches of a variety of publicly accessible internet databases. While three different methodologies were used to obtain the data, the report of the results is organized by survey questions asked of community key informants and individual community members supplemented with data base search results and risk factor screening data.

Participants in the community key informant interviews were identified using criteria based on relevance to the research questions. Key informants had demonstrated leadership in the community, interacted extensively with people of Mexican descent, or

worked with an agency that provided services to people of Mexican descent. Sampling included an emphasis on diversity of profession, experience, gender, age and ethnicity. Twenty-four potential informants were solicited for participation in the interviews. Of those solicited, 15 participated, three declined, and eight did not respond to written, email or telephone request. Of those who participated, five were in the health care field (i.e., nurses, doctors), four were associated with a religious organization (i.e., pastors, church staff), three were in government service, and three were from other community organizations. This group included five Hispanic and 10 non-Hispanic white participants.

Since each stakeholder was recruited to share perspectives from their unique vantage point, data saturation per se was not the goal. Rather, interviews ceased when interview content became repetitive and it was felt by the researcher that no new information was being collected.

Participants in the individual community member interviews were identified at community health screening events as described in Chapter Three using criteria based on relevance to the research questions. Individual community members were of Mexican descent and living in Berwyn and could speak either English or Spanish. A convenience sample of health screening participants was used. Eighteen individuals agreed to participate and met the criteria for individual community member interviews. Of those who participated in these interviews, 14 were born in Mexico, two were born in Guatemala, and two were born in the U.S. The mean amount of time spent in the U.S. was 23 years with a range of 8 to 54 years. Nearly all levels of education were

represented and not one level of education was more frequently represented than another. Of the 11 community members that responded to the query about annual family income, five reported \$15,000 to \$20,000. With regard to type of work performed eight of 14 reported “working for pay.”

The results are organized using the community key informant questionnaire as an outline. Individual community member responses and database search results are reported as they parallel questions and answers to the community key informant questionnaire (KIQ) (see Appendix C). In addition, health screening results are reported under the section of Risk Prevalence.

Research Question 1 (Social Determinants of Health)

Results from KIQ question 1: What do you think are the top three issues or concerns among people of Berwyn who are of Mexican descent?

Eight of the 15 community key informant interviewees reported “jobs, unemployment, and the economy” as the top concern of people of Mexican descent. Key informants noted that these issues are a concern of the general population as well. One participant who worked in the community through the church reported that “a lot [of Mexicans] work in construction, and when the weather is bad or construction jobs disappear, especially for persons without documentation, employment is very hard.”

Immigration issues were the next most common concern reported. Examples provided included the concern of being in the U.S. illegally with the threat of deportation, inability to access community services or to work legally, and being away from family members remaining in Mexico.

Availability and adequacy of housing and concern about safety and well being of family were also commonly reported. People of Mexican descent are widely affected by home foreclosures during the study period. A community key informant speculated that this could be because they rent from an owner whose property undergoes foreclosure or because they own the home themselves. In addition, according to a community outreach worker “Berwyn has strict building codes [with regard to number of occupants] and it’s clear who they are targeting by limiting the number of people in a house.”

The well being of the family and the focus on children came up frequently. This concern was described as fear of gang violence, getting necessary vaccines for children, education, assuring that the children were educated and getting everything they needed. An inability to provide for the family emerged as a primary concern.

Finally, “cultural issues” such as lack of bilingual services across the community was reported as a concern by many. Most expressed that bilingual services were inadequate, although many expressed that these services were improving. The mayor of Berwyn reported that “most people are not bilingual who work in public service. However, most literature provided [about government services] is bilingual.”

Results from KIQ question 2: What do you think are the top three health problems or concerns among people of Berwyn who are of Mexican descent?

Diabetes was the most widely reported health concern. Ten of 15 community key informant interviewees reported that people of Mexican descent view diabetes as a health concern, but only when they see firsthand the complications related to it. A diabetes nurse educator reported that people get very concerned when “a family member is going

blind or a family member has a limb amputated.” Specifically, the health care providers noted that preventive measures are rarely sought or recognized and that people of Mexican descent seek help only when something affects them acutely. Of the individual community members surveyed, “diabetes” was cited as the greatest health problem facing people of Mexican descent by 11 of the respondents. The second most commonly noted health problem was “heart” and “weight” which were both mentioned three times.

Cardiovascular disease, cancer, access to care, obesity, hypertension and mental health were each reported two to three times by community key informant interviewees but all were reported much less than was diabetes. Most civil servants and community workers did not know of any primary health concern besides diabetes in this population.

Results from KIQ question 3: What do you think the community (specifically those of Mexican descent) thinks or feels about cardiovascular disease? How important or not important do you think CVD is to people of Mexican descent?

Five community key informant interviewees (mostly health care providers) noted that this population recognizes CVD as a problem if they or a family member have experienced a heart attack or stroke. But most people do not make the connection between risk factors and disease or preventive therapies. Many people in the community will participate in health screenings and may “get treated (like taking cholesterol medicine for a month) and think they are better” reported a community health outreach worker. While health screenings appear to be well attended, three interviewees reported that “there does not seem to be a connection between the relationships of behavior to disease.” A public health nurse noted that while people do attend the screenings,

participants are mainly interested in blood sugar results for the risk of diabetes or getting their children screened for risk in general.

A cardiologist spoke specifically about young Mexican American women, noticing that they have a problem with being overweight (a CVD risk factor). However, “they look around them and think ‘well, everyone else around me looks like this too. So why should I worry?’” A priest stated that there is general feeling that “I should get in shape” but it is driven more by “caring what they look like.”

When individual community members were asked on a scale of 1 to 10 “what do you believe your level of risk is for having heart disease?” (1 being no risk of disease and 10 being at the highest risk of having heart disease) the responses ranged from 1 to 10 with a mean of 6.1. When individual community members were asked what is the number one cause of death in people of Mexican descent most answered “heart problems.”

Results from KIQ question 4: What do you as a community leader perceive as behaviors or causes of CVD in the people of Berwyn who are of Mexican descent?

Ten of 15 community key informant interviewees reported “diet” as a cause of CVD in this population. Specifically, it was thought that volume of food consumed was high. A community health outreach worker, who is of Mexican descent, noted that “the quantities of the food are always large. We have *tamilizas*. These are parties where we get together and socialize and make tamales. Food is the primary part of our socializing.” The preparation of the food (frying food, use of Crisco™) was thought by a health educator who is of Mexican descent to be a contributor to CVD. Two interviewees

mentioned that meat is also a large part of the diet and the high volume of food was common.

While community members were not asked about volume of food eaten, they were asked “how many servings of fruits and vegetables do you usually eat per day?” The responses ranged from none to five with an average of 2.3.

Lack of exercise was seen by the community key informants as the next contributing factor to CVD in this population. A priest noted that “people don’t go outside enough.” He theorized that in Mexico people would walk places and felt more comfortable being outside. He thinks that it is different when they come to the U.S. A government service employee said she observed that “parents don’t walk their children to school...even if it’s just a few blocks. They drive them instead.” She thought that reinforced a sedentary lifestyle. Other factors noted as contributing to CVD are having the diagnosis of diabetes, being obese and alcohol use/abuse.

When individual community members were asked if they “engage in *strenuous* exercise or hard physical labor” subjects were evenly split (eight said yes and seven said no.) When asked if they exercise or labor at least three times per week, 12 answered yes and four answered no.

Results from KIQ question 5: If a person of Mexican descent wanted more information about their cardiovascular health or had a problem with their “heart health” where would they go? What would they do?

Most community key informant interviewees responded that MacNeal Hospital and its associated clinics were the primary source of care for people in the community.

One community outreach worker commented that the “emergency department is probably over utilized.” None of the interviewees expressed a belief that there was a lack of health care facilities.

Another source of care noted by interviewees was the Berwyn Public Health District (BPHD). The medical director for the BPHD and the public health nurse at the BPHD noted there is one nurse and one secretary at the site. Since these interviews both the nurse and secretary have left the BPHD. There is a physician who is available for health fairs (three per year) and for consultation but who is employed full time at a private practice group so he spends limited time at the BPHD. Primarily the BPHD provides information to community members so that they may access community resources and enroll in state and federally funded programs. The BPHD is also available for immunizations, school physical exams, vital statistics, and occasional health fairs. An initiative over the past year has been “Doc on the Block” where a health fair is set up in a specific neighborhood and people can walk to it to get CVD risk screening and counseling done. In 2009 there were two “Doc on the Block” events with a total of 42 people in attendance.

Another site for care reported by a community outreach worker is the school based clinic located at Morton High School-East (located in Cicero, IL). This clinic is mainly for children, but it is underutilized according to this respondent.

Most key informant interviewees mentioned that if the community member has an acute illness and is uninsured they will go to Cook County Hospital. Table 5 is a list of hospitals in the western suburbs of Chicago. If they are uninsured and it is not acute

there are three centers that provide care: Alivio Medical Center, PCC Community Wellness and Access Community Health Network. However, one of the community outreach workers noted that the organizations are “swamped” and see 20,000-25,000 persons per year with long waits to be seen by a health care provider. Inquiries to Alivio and PCC Community Wellness were not answered so this data could not be confirmed. Two of the interviewees felt these resources were “great.” The researcher attempted to contact the manager of Access Community Health Network for an interview but attempts at contact were unanswered.

Community key informant interviewees were further probed about whether they “perceive lack of or insufficient insurance as a barrier to receiving health information or care.” They responded with a range of answers. Four interviewees believed that lack of insurance or insurance options was a barrier to care. Two interviewees stated that there was a “perceived” lack of insurance because community residents did not access the subsidized health insurance options that exist. A cardiologist noted that even if the resident has Public Aid, only a minority of physicians takes public aid, and, after about the first 120 days of the year, the funds for payment from the government are “tapped out.” There is no incentive for physicians to take Public Aid patients, although most physicians will see a small number of patients who have it. Two interviewees said they did not know if this was a barrier or not. Regardless of perceptions about availability of insurance, all interviewees responded that health care costs were a barrier to receiving CVD information and care.

Table 5. Hospitals in the Western Suburbs

Hospital	Address	City
Cook County/Stroger	621 W. Winchester	Chicago
Mt. Sinai	1500 S. California	Chicago
St. Anthony	2875 W. 19 th St.	Chicago
West Suburban-Resurrection	3 Erie Ct.	Oak Park
Rush/Oak Park	520 S. Maple Ave.	Oak Park
Loyola University Medical Center	2160 S. 1 st Ave.	Maywood
MacNeal	3249 S. Oak Park Ave.	Berwyn
Westlake	1225 W. Lake St.	Melrose Park
Loyola University Health Systems at Gottlieb	701 W. North Ave.	Melrose Park

A community outreach worker noted that most people tend to get care wherever they can and do not have a relationship with a specific health care provider. She expressed that there was no continuity of care and said most people did not understand that it was important to have a “medical home.”

When individual community members were asked “is there a place you usually go when you need routine or preventive care such as a physical exam or check up?”, 11 answered “yes” and five answered “no.” There was no particular place that individuals noted going for care but most noted a “doctor’s office.”

To further answer this question about community access for heart health information/care, an internet database search was conducted. Using the Google search engine a search was done using terms “health care facility” and “Berwyn, Illinois.” Results showed several options for health care in this community (see Table 6.) The primary health care facility in Berwyn is MacNeal Hospital which is owned by Vanguard Health Systems. Vanguard Health Systems is a Nashville-based for-profit hospital

system. There are numerous private practices owned by MacNeal (Vanguard) as well. However, it should be noted that only MacNeal Hospital and its clinics and the Berwyn Public Health District are technically located in Berwyn. All other facilities are located in bordering communities such as Riverside, Oak Park, and Cicero. The two facilities in Berwyn do not consistently provide bilingual services while the facilities outside the municipality of Berwyn do.

Results from KIQ question 6: Does being of Mexican descent make any difference in the awareness/attitudes/knowledge/beliefs/behaviors (regarding cardiovascular health and disease)?

Community key informants had some difficulty answering this question. They tended to focus on a few barriers to care, namely use of complimentary and alternative medicine (CAM) and language. The following is a description of how respondents found CAM and language differences barriers to cardiovascular health.

Table 6. Health Care Facilities in and Around Berwyn

Facility	Address	Description	Number Served	Mexican American (%)	Hours	Payer Mix (%)	Bilingual
MacNeal Hospital ^a inpatient	3249 S. Oak Park Ave Berwyn, IL 60402	Private Hospital system owned by Vanguard	17,422 admissions	31.60	24 hours	35.5 Medicare 20.5 Medicaid 39.6 Private 3.4 Charity	Yes
MacNeal Hospital ^a outpatient	3249 S. Oak Park Ave Berwyn, IL 60402	Private Hospital system owned by Vanguard	177,849 visits	Not available	Varies, typically M-F (9-5)	16.4 Medicare 23.2 Medicaid 51.6 Private 1.0 Charity	Not all offices
Berwyn Public Health District ^b	6600 W. 26th St Berwyn, IL 60402	Health District of Berwyn Township	Not available	65	M-F (9-5)	Not tracked	No
Loyola Family Health Center ^c	1950 Harlem Ave Riverside, IL 60546	Outpatient facility for large academic health system	Not available	Not available	M-F (7:30-5/7) Sat only in the fall	Not available	No
PCC Community Wellness Center ^d	6030 W. Roosevelt Rd Oak Park, IL 60304	Non-profit organization founded to meet the healthcare needs of the underserved of Chicago's west side communities	~32,000 visits	Not available	M-F (9-5/8)	3 Medicare 58 Medicaid 23 Private 16 Charity	Yes

Facility	Address	Description	Number Served	Mexican American (%)	Hours	Payer Mix (%)	Bilingual
Alivio Medical Center ^e	4842 W. Cermak Rd Cicero, IL 60804	Non-profit community based initiative focused on health needs of the Mexican community	Not available	98	M-F (8:30-5), W (1-8), Sat (9-1)	Not available	Yes
Access Family Health Center Hawthorne ^f	2307-09 S. Cicero Ave Cicero, IL 60804	Largest private primary health care provider to the underserved and largest community health center organization.	19,608 encounters	92	M-F (8-6/8) every other Sat	3 Medicare 46 Medicaid 23 Private 7 Charity	Yes

^a Illinois Department of Public Health, Health Systems Development (2008)

^b Personal communication with Elizabeth Pechous, President Berwyn Public Health District, August 31, 2010.

^c Loyola University Health System (2010). Retrieved September 20, 2010 from http://www.luhs.org/location/sites/pcdetail.cfm?site_id=7

^d Alivio Medical Center (2010). Retrieved September 20, 2010 from <http://www.aliviomedicalcenter.org/>

^e PCC Community Wellness Center (2010). Retrieved September 20, 2010 from <http://www.pccwellness.org/>

^f Personal communication with Dr. Milton Eder, Director of Research Programs Access Health Care, September 20, 2010.

Different forms of CAM were described by respondents. One type of CAM (folk medicine) was described by a church based community outreach worker who noted that in the small towns of Mexico *curanderos* (individuals in the community that practice folk medicine) provide health advice and information which mainly includes use of herbs as treatment for ailments. This tradition has carried over to their practice in the United States. Several health care providers also noted the use of natural remedies like herbs and teas as a common treatment. The diabetes nurse educator (who is of Mexican descent) noted that the use of the *curandero* for “natural” treatment is frustrating to her because the patients only come to her “after the *curandero* has failed them. The patients may be very sick by then.”

A church based community health worker stated that most people without insurance will pursue CAM or contact a priest before seeking conventional medical care. Next they would try a social service agency or maybe a school clinic. The health worker explained that community residents’ last option is the emergency department. A priest interviewee believed that the community residents encounter a lot of “quakery” in their pursuit of CAM. He agreed that CAM was the first line of help and that people used the emergency department as a last resort. The diabetes nurse educator agreed with the frequency of use of CAM. She added that they may next go to a health care provider who is seen as a “caring expert.” She noted that this community “doesn’t like to look bad in front of the doctor because they become fearful and embarrassed.” Also, she added that they are very appreciative of learning from someone who is a professional.

Another layer to their belief in CAM is that it is a revenue source for many Mexican Americans. Herbalife® is a popular brand of nutritional supplements sold among the Mexican American community. A community outreach worker noted that residents will seek out the resources in what she called a “parallel economy.” In other words, “many are in the business of selling herbs to supplement their income. They will generally get them from other Latinos so they believe they may work.” She notes that they not only generate income from complementary and alternative medicine but also use it as a health resource.

Informants were probed regarding their views of language as a significant barrier to receiving information or CVD care. Respondents were split on their opinion; some felt the bilingual services were adequate or at least improving, while others felt that these services were poor. A physician noted that some health care staff were resistant to utilizing translation services or providing bilingual material. Another community outreach worker noted that many will travel to Cicero for care because they are more likely to find health centers that are completely bilingual. She noted that “these centers have Spanish language signs all over the front of the office and in the windows. Not just a small sign that says ‘*hablamos espanol*.’” They know that they will be comfortable and understood there.

The cardiovascular nurse practitioner recounted an instance she observed in the Emergency Department, where a physician was speaking to a patient, giving instructions about her care. He asked if she could speak English. The patient said yes. The physician proceeded to tell the patient she had gall stones and needed to call a surgeon about having

surgery. After the physician left, the nurse practitioner overheard the patient calling someone and explaining in Spanish that she had kidney stones and needed surgery. The interviewee noted that sometimes people may speak some English but not enough to get the important or detailed information. They also may be too embarrassed to say otherwise they do not completely understand.

The cardiologist noted that MacNeal Hospital is trilingual (English, Spanish and Polish) and the Mayor noted that government bilingual services are more available than in the past. However, both conceded that there are hospital, medical office and public service employees who demonstrate resistance toward non-English speakers. According to the U.S. Census (2000) of persons in Berwyn over the age of 5 who speak Spanish, 6.9% speak English “not well” or “not at all.” Of this 6.9%, 3,459 people are between the ages of 18 to 64.

While CAM and language barriers were the two most reported cultural aspects of being Mexican that affected ability to receive care or information, three interviewees noted that the structure of social services and government has also presented barriers to community residents. Many residents are not accustomed to the idea of a “medical home,” and go where they can get care and do not consistently use the same provider. The public health nurse noted that because they come from a country with a different health system they do not understand the insurance/payment system of the United States. The Mayor added that the Mexican residents tend to be skeptical of government. He did not know if this was due to immigration issues or a distrust of the Mexican government that carried over to the U.S. He added that there is an organization called “Solutions for

Care,” which was created by the city in an attempt to bridge this gap. This program was formally called the Council on Aging and continues those services for the area.

The state congressional representative noted that a program had been legislated that would bring instruction on being “culturally conscious” to the health care setting. Health care providers in this program would learn about CAM. She believes that programs like this facilitate respect and a connection between provider and patient.

These key informant interviewees were asked if they perceived immigration status as a barrier to receiving information or CVD care. Respondents were split in their responses. Health care providers felt that it was not a barrier to receiving care; however, community outreach workers felt that it was a barrier. One interviewee noted that community residents are “scared to get benefits for themselves if they are undocumented but they may go ahead and try to do it for their kids. There is confusion about what’s okay and not okay depending on your immigration status.”

Results from KIQ question 7: Does the socioeconomic status (income or education level) of those of Mexican descent in Berwyn have an impact on their knowledge, beliefs or attitudes toward cardiovascular health or disease?

All community key informant interviewees agreed that socioeconomic status had a negative effect on knowledge about CVD, with some stating that a lack of education also affected knowledge about health in general. Some interviewees focused on education in general. A community worker felt that the SES “effected access to schools and lowered self-confidence; they (residents of Mexican descent) become self-conscious about their education level. They don’t ask questions because they are not educated.” In

contrast, a cardiovascular nurse practitioner felt “their education level is on the same level as the rest of the community.”

A community health outreach worker felt that the Mexican community is looking for more information. She stated that “they want to be healthy and will use preventive strategies.” A public health nurse noted that this was specifically true if residents were “more educated” and wanted preventive health information for their children. She also noted that while much of the population seems to be uneducated, there are large turn outs for the health fairs and clinics.

Others interviewees focused strictly on economics. It was noted that the types of jobs the residents typically have, low paying labor or service industry jobs, often do not have health insurance. Also, if a person is working two jobs due to financial necessity they are less likely to focus on health issues. The cardiovascular nurse practitioner noted that missing work to see a doctor is often not an option for residents. A church based community outreach worker added that “the ability to afford services and to be able to understand the complexity of information and the U. S. systems” was a challenge to the Mexican people of the community. She also noted that the cost of medication is prohibitive.

Review of U.S. Census (2000) data showed that Hispanic/Latino and non-Hispanic whites had nearly the same median and mean annual household incomes in Berwyn. The mean income for Hispanics was \$52,574 and \$52,791 for non-Hispanic whites. The median was \$44,955 and \$43,185, respectively. Of the total families

accounted for in the U.S. Census (N = 12,953), 3.3% of Hispanics/Latinos lived below the poverty level and 2.4% of non Hispanic whites lived below the poverty level.

Results from Questions KIQ 8 and 9: These questions on the community key informant survey probed respondents to comment about the social environment including the state of schools, housing, crime, customs, language and spiritual beliefs as barriers or facilitators to cardiovascular disease or health. Because the information overlapped, the answers provided are reported in previous and subsequent sections in this chapter (i.e., questions 1-7 and 10-14).

Results from KIQ question 10: What type of stressors do you think are in this community that may affect the mental health of someone of Mexican descent?

Equally reported stressors to people of Mexican descent in this community were the economy and the changing family structure. A priest noted:

Values are different in Mexico. There is a strong community focus and family focus. Here in the U.S. it is much more individualized – focused on the success of the individual. In Mexico there is a strong Catholic tradition where the focus is on the relationship of community to God. However, in the U.S. there is more of a Protestant tradition where the focus is on the relationship of person to God. Because of this people are more isolated here. This is something that they are not used to and I believe it affects their spiritual well being and their faith.

He also notes that they find themselves working harder here than they ever have, sometimes working two or three jobs. They came to the U.S. with high expectations and find out it is expensive to live here. They have a hard time providing for their family and end up spending less time with them, despite family being a core value for Mexicans; which causes a lot of frustration. They are also disappointed in themselves for not being

able to send as much money back to Mexico as they would like. Often they are separated from their families who remain in Mexico. All of these factors contribute to stress.

Other informants added that changing family dynamics puts stress on the marital relationship. Women are working outside the home and learning that they can have their own opinions and rights, resulting in a changing dynamic. Both the church based community outreach worker and public health nurse noted that there is frequent domestic violence.

Several community key informant interviewees, and especially the community outreach workers, noted that depression was commonly expressed by people in this community. Some speculated that the depression was a result of chronic illness, either having illness or being a care giver, stress of not speaking English, being illiterate or financial challenges.

When community members were asked “what is your overall level of stress on a scale of 1 to 10 (1 being no stress and 10 being the most stressful life you can imagine) their answers ranged from 1 to 10 with an average stress level of 4.9. When asked “what is your overall quality of life on a scale of 1 to 10 (1 being the worst life you can imagine and 10 being the best life you can imagine) their answers ranged from 2 to 10 with an average quality of life at 7.1.

Research Question 2 (Physical Determinants of Health)

The focus of the next three KIQ questions (11-13) was the physical environment. The physical environment for this study includes access to fruits and vegetables, parks, and public transportation as well as the presence of hazardous waste sites and air quality.

Results from KIQ question 11: In the Berwyn community what is the availability, in your opinion, of grocery stores or markets that sell fruits and vegetables?

Most community key informant interviewees expressed that fruits and vegetables were available and affordable, although two respondents added they were not as readily available as they would be in Mexico. The Mayor pointed out that there is no large grocery store like “Jewel” (technically called Jewel-Osco[®]) in Berwyn. A church based community worker noted that residents like to “go into their stores” and generally do not like to go to “Jewel.” A diabetes nurse educator thought that fruits and vegetable vendors were not readily available but that it was not perceived as a problem because people did not “search them out anyway.” A cardiovascular nurse practitioner noted that regardless of the availability of fruits and vegetables their diets are not necessarily high in fruits and vegetables. The public health nurse pointed out that in the community people do not make the connection between food and health.

Using Googlemaps a search was done using the terms “grocery store Berwyn, Illinois” and “fruits and vegetables Berwyn, Illinois.” Results from these searches yielded 20 stores where fruits and vegetables can be purchased. Convenience stores (such as 7-Eleven[®]) were not included in the results as their availability of fruits and vegetables is limited and typically expensive. Five stores were included in the results although they were located in North Riverside (three) and Oak Park (two). While they were not technically located within the city limits of Berwyn they were located on boundary streets and considered readily accessible to the target population.

Locations of stores were mapped (see Table 7 and Figure 3) and it was found that most of the population of Berwyn is located within .5 miles of a fruit and vegetable outlet. The Southern one third of Berwyn, with the exception of the far southwestern corner, is outside of .5 miles of a grocery store.

Most individual community member respondents (seven of 18) reported shopping at the larger grocery stores like Jewel and Dominick's. Other stores mentioned by name were Fair Share and Tony's.

Results from KIQ question 12: Do you feel parks and play lots are accessible, clean and safe in Berwyn? Are there other places people of Mexican descent can go to participate in physical activity?

Through an internet database search and through community key informant interviews it was determined that there are three major entities that manage the parks and play lots of Berwyn. The first organization is the Berwyn Recreation Department, a department of Berwyn city government. Its public service responsibilities include promotion, initiation and operation of leisure, athletic and recreational activities for citizens of all ages. This department also maintains and staffs over 23 acres of park and play lot grounds in Berwyn (City of Berwyn, 2010).

The second organization is The Berwyn Park District which is a separate municipal governing agency established for the purpose of providing parks, facilities and recreational programs for the residents of Berwyn. The Park District is governed by five Commissioners who are elected for six year terms (City of Berwyn, 2010).

Table 7. Stores with Fruits and Vegetables in and Around Berwyn

Name	Address	City	Zip
Jewel-Osco	7036 Roosevelt Rd	Oak Park	60304
La Rosita	6609 W. Roosevelt Rd	Berwyn	60402
Fair Share Finer Foods	6226 Roosevelt Rd	Oak Park	60304
La Famosita	7124 16 th St	Berwyn	60402
Eli Grocery	1400 Kenilworth Ave	Berwyn	60402
Tototlan Meat Market	6706 16 th St	Berwyn	60402
Jerez Grocery	1500 East Ave	Berwyn	60402
Carniceria Cinco Hermanos	6500 16 th St	Berwyn	60402
ALDI	2000 S. Harlem Ave	North Riverside	60546
Familial Foods, Inc.	7065 Cermak Rd	Berwyn	60402
Supermercado Morelia	6830 Cermak Rd	Berwyn	60402
Berwyn Finer Foods	6323 Cermak Rd	Berwyn	60402
Supermercado Berwyn	6220 Cermak Rd	Berwyn	60402
Jewel-Osco	7201 W. 24 th St	North Riverside	60546
Tony's Finer Foods	7401 W. 25 th St	North Riverside	60546
Valles Produce	6603 26 th St	Berwyn	60402
Carnizeria Don Goyo	6328 26th St	Berwyn	60402
Green Acres Food Market	2630 Ridgeland Ave	Berwyn	60402
Justice Produce, Ltd.	6901 Ogden Ave	Berwyn	60402
Berwyn Fruit & Vegetable	3811 S. Harlem Ave	Berwyn	60402
Jewel-Osco	7122 W. 40th St	Stickney	60402
ALDI	7235 39th St	Lyons	60534
Super Mercado Chapala	5909 W. Cermak	Cicero	60804

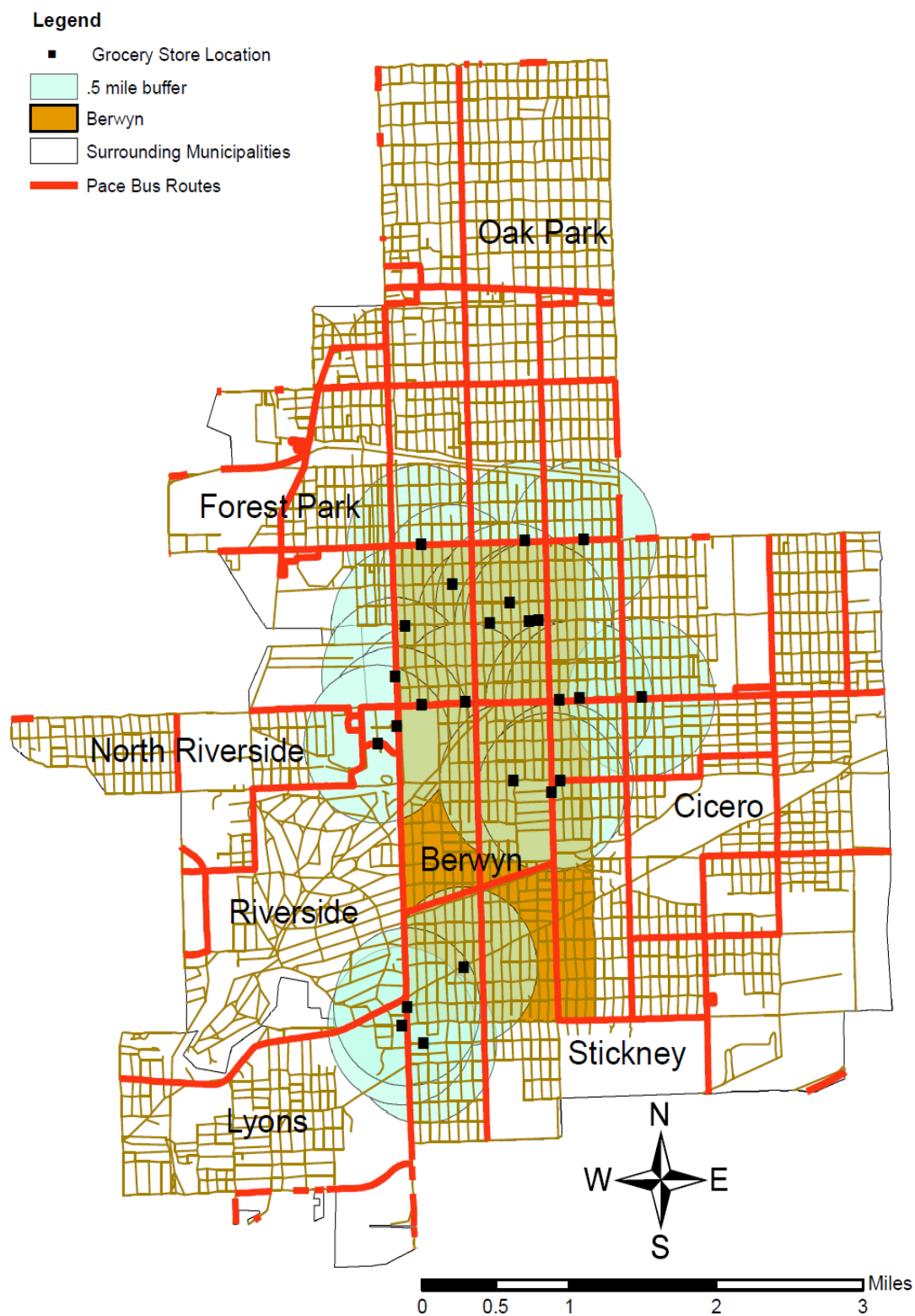


Figure 3. Stores with Fruits and Vegetables in and Around Berwyn and Pace Bus Routes

Finally, the North Berwyn Park District is an autonomous governmental entity established in 1976. It was established because residents felt there were inadequate recreational services provided within the current agencies (Berwyn Park District and Berwyn Recreation Department) whose boundaries did not cover the north end of Berwyn. The North Berwyn Park District is comprised of full-time and part-time staff, with volunteers, under the supervision of an executive director who is responsible to an elected five member board of commissioners. This park district has also developed a collaborative intergovernmental agreement with District 98 Schools for use of gyms and fields before and after school use. The North Berwyn Park District currently serves >20,000 residents (North Berwyn Park District, 2010).

Another major provider of recreational opportunities in Berwyn is the Pav YMCA, an independent, community-based facility. Chartered in 1970, the current facility was completed and opened in 1986 to serve the west suburban Cook County communities of Berwyn, Cicero, Stickney, Lyons, Forest View, Riverside and North Riverside. It is located at the corner of 29th Street and South Oak Park Avenue in Berwyn and has undergone two expansions, both within the last ten years (one to expand its Wellness/Fitness Center, the other to accommodate a handicap accessible elevator and a Teen & Senior Center).

The Pav YMCA is a charitable, not-for-profit, 501(c)3 organization with the mission: "To put Christian principles into practice through programs that build healthy spirit, mind, and body for all." In fulfilling their mission, they do not turn away individuals based on their inability to pay. The Pav YMCA awards over \$100,000 in fee

assistance to individuals and families annually through its Strong Kids Scholarship Program. The Pav YMCA has a membership of approximately 9,000 individuals. Nearly one-third of their members are older adults and nearly one-half million visitors each year, an average of about 40,000 each month. They offer over 200 programs which serve individuals of all ages. Pav YMCA employs regular full time and part time staff as well as over 200 volunteers in addition to a 20-member volunteer Board of Directors (Pav YMCA, 2010).

A list of all recreation areas, location, available activities, and condition is provided in Table 8. A summary is included of all equipment and facility descriptions listed on each facility's internet web site. On August 21, 2010 from 10:30 am to 1:00 pm the researcher made visual assessments of each described facility. This date was a Saturday, mostly sunny and temperature in the mid-80s Fahrenheit. Visual observation was a "snap shot" lasting a few minutes. It was sufficient to assess presence of individuals and state of the facility at that point in time. After observing all parks it was found that only two parks were being used. In Proksa Park there were several people picnicking, walking and playing tennis. In Freedom Park one family appeared to be preparing to play soccer. All remaining parks were empty. Previous observations demonstrated that the Pav YMCA is a heavily used facility.

Table 8. Recreation Areas, Berwyn

Facility	Address	Managed By	Resources	Indoor/ Outdoor	Condition
Baseball Alley	2901 East Avenue	Berwyn Recreational Center	Baseball fields	Outdoor	Good condition
Berwyn Gardens	2200 Grove Street	North Berwyn Park District	2 inline skating rinks, game tables, gazebo and performance space, 2 modular play sets, sand volleyball court, green space, gardens, and benches	Outdoor	Long narrow park, may be good for walking, No net for volleyball and signs stating "no ball playing"
Community Center/ Pryce Park	1619 S. Wesley Avenue	North Berwyn Park District	Spray pool, 2 modular play units with padded rubber ground surfaces, 2 swing sets, pergola structure, green space, and gardens	Indoor & Outdoor	Good condition but closed and locked
Cuyler Pool	1900 Cuyler Aveune	Berwyn Recreational Center	Outdoor, wading, and splash pools	Outdoor	Pool closed with no water, green space fair, narrow park
Freedom Park	3701 Scoville Aveune	North Berwyn Park District	Regulation size, lighted soccer field, picnic area, wading pool, and new playground area	Outdoor	Clean spacious park, appeared new
Friendship Park	2430 Kenilworth Avenue	Berwyn Park District	Playground on grounds Piper School	Outdoor	Good condition

Facility	Address	Managed By	Resources	Indoor/ Outdoor	Condition
Hessler Park	3406 Kenilworth Avenue	Berwyn Park District	Playground and picnic area	Outdoor	Small with no field
Janura Park	6610 28th Street	Berwyn Recreational Center	Ball fields, basketball courts	Outdoor	Good condition
Jefferson Field	7020 16th Street	North Berwyn Park District Intergovernmental agreement with district 98	Artificial surface game field; the park is used for t-ball, soccer, flag football, and various activities	Outdoor	Good condition (consists of a parking lot covered in artificial turf)
Kriz Park	1552 Maple Avenue	North Berwyn Park District	2 modular playsets, large inline skate and skateboard field with ramps and rails, green space and a benched sitting area.	Outdoor	Good condition
Lesak Park	6600 26th Street	Berwyn Township	Memorial park	Outdoor	Small with no field
Liberty Cultural Center	6445 W. 27th Place	Berwyn Park District	Gym, basketball courts	Indoor	Renewly reinvated, did not visualize inside
Morton High School	2400 Home Avenue	School District	Gym, track, field, tennis courts	Indoor & Outdoor	Publicly accessible during certain hours. Good condition
Mraz Park	6822 Riverside Drive	Berwyn Park District	Passive park in the center of town with a Veterans Memorial Flag Pole and decorative fountain	Outdoor	Small, in good condition, not intended for activity

Facility	Address	Managed By	Resources	Indoor/ Outdoor	Condition
PAV YMCA	2947 S. Oak Park Avenue	Private, YMCA	Gym, pool, fitness center, track, activity program for range of ages	Indoor	Fair condition, busy especially in the fall winter (per prior observations)
Pavek Community Center	6501 31st Street	Berwyn Recreational Center	Main offices, Gymnasium, pool, sport courts, and meeting rooms	Indoor/ Outdoor	Sport courts locked, playground good condition, pool good condition
Prairie Oak Gymnasium	1427 Oak Park Avenue	North Berwyn Park District Intergovernmental agreement with district 98	Athletic programs, after school programs, soccer, volleyball, basketball, and special events	Outdoor	Could not observe
Proksa Park	3001 S. Wisconsin Avenue	Berwyn Park District	Activity center, 3 lighted tennis courts, 6 horseshoe courts, 2 baseball diamonds, playground area, 2 picnic groves, a butterfly garden, 2 ponds, and a creek (approx 15 acres)	Outdoor	Largest park in Berwyn, well maintained. Excellent site for all types of activities except swimming
Smirz Park	3401 Highland Avenue	Berwyn Park District	Playground and picnic area, skate park	Outdoor	Good condition

Facility	Address	Managed By	Resources	Indoor/ Outdoor	Condition
St. Mary of Celle Baseball Field	1301 Wesley Avenue	North Berwyn Park District	Baseball field	Outdoor	Good condition, intended for organized leagues
St. Mary of Celle Family Strengthening Center	1448 Wesley Avenue	Private, Catholic Charities	Gym	Indoor	Excellent condition, renovated approximately 3 years ago
Sunshine Park	6810 29th Avenue	Berwyn Park District	Park District maintenance building, sand volleyball court, bocce ball courts, playground center, picnic area, and gazebo	Outdoor	Excellent condition
Unity Park	1227 Kenilworth Avenue	North Berwyn Park District	Playground and picnic area	Outdoor	Locked

In order to assess physical accessibility to areas of recreation the locations of parks, playlots, and activity facilities were mapped (see Figure 4). All parks listed by the North Berwyn Park District, Berwyn Park District and Berwyn Recreation Department were mapped. Also included were the Pav YMCA, St. Mary of Celle Community Center and Morton High School. It was found that most of the population of Berwyn is located within .5 miles of a park or playlot. However, after park condition and accessibility were visually assessed it was determined that some recreation areas could not be considered accessible. In other words, if the recreation area was in poor condition for use it was not included on the map. Examples of this were two pools that were drained of water and not open for use. In addition, parks that were considered “memorial” parks without sufficient area for walking or game playing were not included. By narrowing down to truly useable and accessible parks a new map was generated (see Figure 5). Using these parameters two areas of Berwyn were void of recreation areas. In the Northeast portion of Berwyn from Roosevelt Road to Cermak Road and from Lombard Ave. to Highland Ave. there are no useable or accessible parks. The second area void of parks is the Southwest corner of Berwyn (from the RTA tracks to Pershing Road and from Harlem Avenue to Clinton Avenue).

When key informants were asked about the parks and playlots of Berwyn most expressed awareness of the variety of park districts and organizations that provide activity opportunities. The public health nurse and the Mayor described the main providers of recreational activities and facilities and described them as “definitely clean, safe and accessible.”

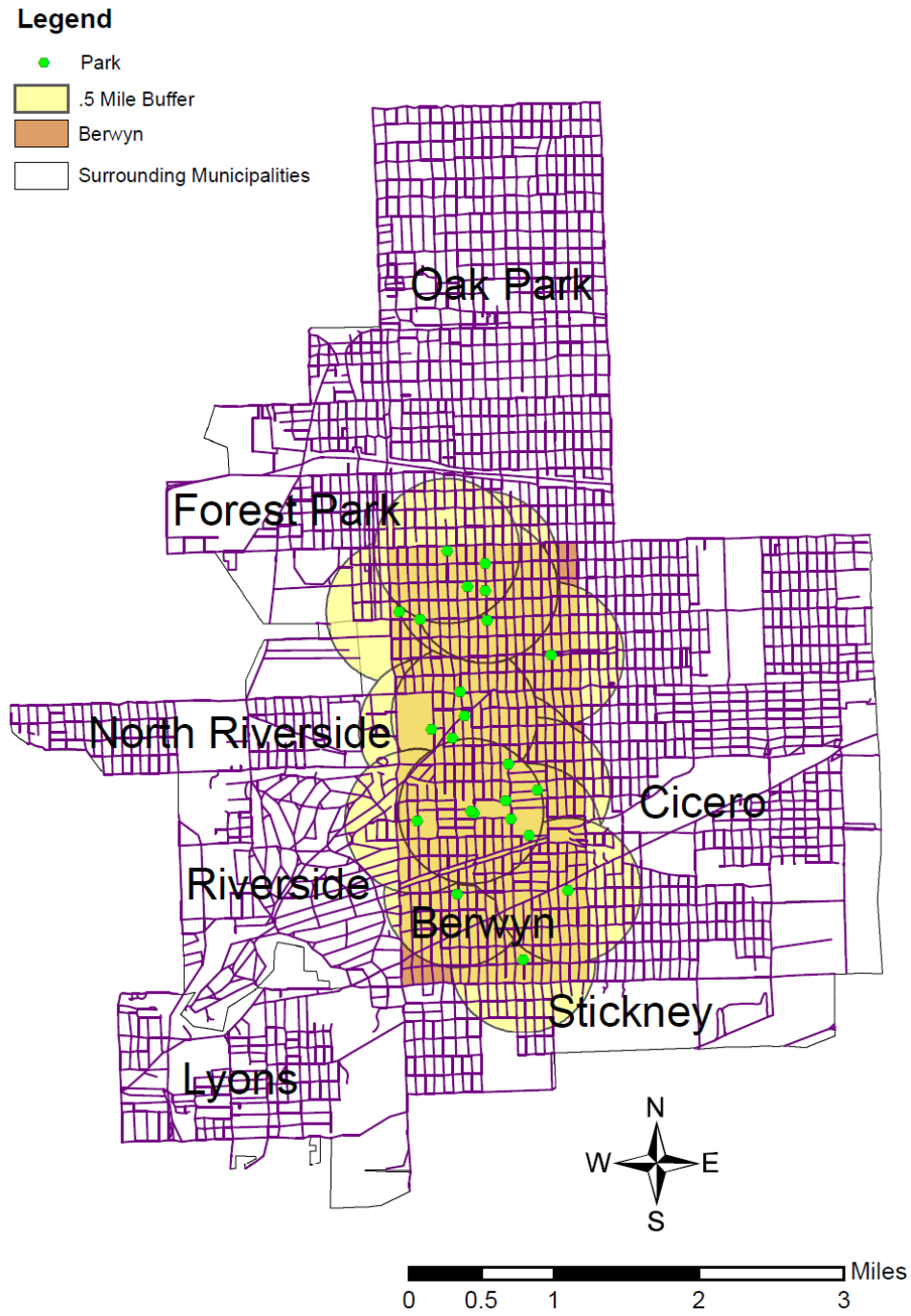


Figure 4. Parks in Berwyn

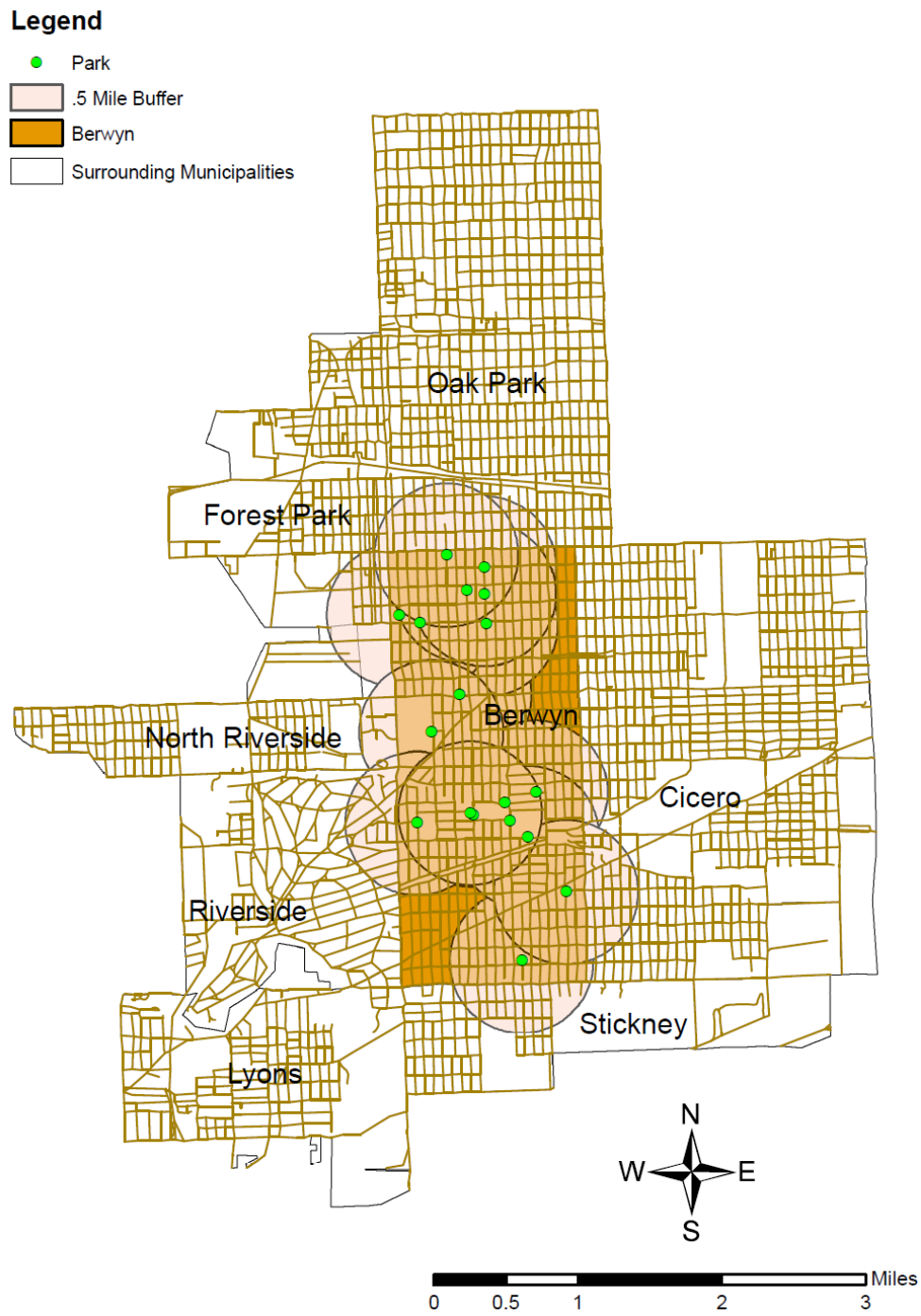


Figure 5. Useable Parks in Berwyn

Regardless of the availability of the facilities a cardiologist noted that exercise does not appear to be part of the culture of the residents of Berwyn. Other respondents echoed this sentiment. The YMCA director noted that people do not sign up for classes but the YMCA director and a nurse agreed that the YMCA track has become busier. However, the community health outreach worker noted that an organized sport like soccer is very popular and the soccer fields always seem full with both adults (men) and children. When asked if girls were equally involved she did not know.

When individual community members were asked where they go to perform physical activity, most (five) responded home. The next highest response was street/sidewalk (three).

Results from KIQ question 13: What are the modes of public transportation in the community? Are they sufficient to meet the needs of the community?

There was a wide range of responses to this question. Some expressed that transportation was not an issue because most people walk and it was safe to do so and others stated it was very difficult because directions for buses and routes were not in Spanish. Informants expressed that public transportation was difficult to manage if a person was elderly or had children. In addition, respondents expressed that bus routes are limited and not timely. Informants noted that most people have cars or access to a car. Information from the U.S. Census (2000) supports this observation. According to the Census, of persons greater than or equal to 16 years of age who work, 70.8% drive by themselves to work, 11% use public transportation and only 0.7% walk (U.S. Census Bureau: American Fact Finder (2010)).

The bus service in Berwyn is provided by Pace which was created by reform legislation in late 1983, and began operating throughout Chicago's six-county suburbs, including Berwyn, in mid-1984. Pace is the suburban bus division of the Regional Transportation Authority (RTA). The RTA is the financial review, oversight and planning agency for Pace, Metra and the Chicago Transit Authority (Pace, 2010a).

Pace buses are all wheel chair accessible and have bike racks. Pace also operates paratransit service for individuals with disabilities in addition to its Dial-a-Ride services throughout the suburban area. Regular one-way fare is \$1.75; with reduced fair at \$0.85 (seniors and students qualify for this fair). Table 9 is list of the Pace bus routes in Berwyn and maps of routes can be found in Appendix H. By visual inspection it appears that most of Berwyn is within four blocks of a Pace Bus Route although the proximity to bus route stops is unknown.

Toxic Waste and Air Quality

To further understand the physical environment of Berwyn, toxic waste (i.e., the presence of a superfund or hazardous waste site) and air quality were examined. A superfund site is defined as the federal plan that investigates and cleans up the most complex and uncontrolled hazardous waste site in the U.S. There are no superfund or hazardous waste sites in Berwyn. The nearest superfund site is in Lemont, Illinois which is approximately 20 miles away from Berwyn (Environmental Protection Agency, 2010).

Table 9. Pace Bus Routes, Berwyn

Route	Name	Details
302	Ogden/Stanley	Weekday and Saturday service from border of Cicero and Chicago to LaGrange. Service operates from Cicero CTA Pink Line station to LaGrange Road Amtrak/Metra station. Serves the following major destinations: Morton East H.S., Amtrak/Metra BNSF Line stations (LaVergne, Berwyn, Harlem, Congress Park and LaGrange), MacNeal Hospital and Pier 1 Imports.
304	Cicero-LaGrange	Weekday service from Cicero to LaGrange. Service operates from 54th/Cermak CTA Pink Line station to LaGrange Road Amtrak/Metra station. Serves the following major destinations: Morton West H.S., North Riverside Park Mall, Riverside Brookfield H.S. and Brookfield Zoo.
305	Cicero-River Forest	Provides weekday and Saturday service between the CTA Green Line Harlem Station in Oak Park and Morton College in Cicero. Also serves the Forest Park CTA Rapid Transit Blue Line, CTA Pink Line, CTA Green Line Harlem Station, Oak Park Hospital, Hawthorne Race Track, Trinity High School, Forest Park Mall, Concordia University, and Dominican University. Sunday service operates between 35th/Austin and Forest Park Transit Center via Austin-Roosevelt-Des Plaines.
307	Harlem	Daily service between 63rd/Archer in Summit and the Elmwood Park Village Hall. Serves the Metra BNSF Line Harlem Station, Morton West High School, the North Riverside Park Mall, the CTA Blue Line Forest Park Branch Harlem Station, Oak Park Hospital, Oak Park's Central Business District, the CTA Green Line Harlem Station, the Metra MD-West Line Elmwood Park Metra Station, Concordia University, Dominican University and the Elmwood Park Village Hall
311	Oak Park Avenue	Provides service between North/Narragansett at Chicago-Oak Park border and Lawndale/Joliet Road in Lyons. The Forest Park branch of the CTA Blue Line is served as well as the CTA Green Line at the CTA Lake Street Station, the Berwyn Metra Station (BNSF), Oak Park Metra Station (UPW) and MacNeal Hospital.
315	Austin-Ridgeland	Weekday and Saturday service to Oak Park, Cicero and Berwyn. Westbound service operates from the intersection of Madison/Austin to Ridgeland/Lake. Eastbound service operates from the intersection of Ridgeland/South Blvd. to Madison/Austin. Serves the following major destinations: Austin CTA Blue Line station, Ridgeland CTA Green Line station, Morton East H.S., MacNeal Hospital, Metra BSNF Line LaVergne station, Fenwick H.S. and Oak Park River Forest H.S.

Note. Adapted from Pace. (2010b). Pace. Retrieved September 14, 2010 from <http://www.pacebus.com/sub/schedules/default.asp>

Air quality in Berwyn is measured on the county level (Cook County). The American Lung Association provides a report summarizing air quality based on nationally accepted parameters. The report examined Air Quality System hourly ozone data from 2006-2008. The number of days that the 8-hour maximum concentration of ozone in parts per million occurring within defined ranges (good through hazardous) was counted. The same method was used for short-term particle pollution data analysis with the exception of using daily $PM_{2.5}$ instead of 8-hour maximum. The grade for the county was determined by weighted average. Cook County received a grade of “F” for high ozone and high short term particle pollution days. This grade generally correlates with the number of unhealthy air days that would place the county in nonattainment for the ozone and short-term particle pollution standard (State of the Air, 2010a).

Overall, the metropolitan statistical area of Chicago and Naperville, IL and Michigan City, IN ranked number 16 in a list of areas “most polluted by short-term particle pollution $PM_{2.5}$.” This ranking is out of 366 United States metropolitan statistical areas. When ranked by county, Cook County ranked 18 out of 645 evaluated counties “most polluted by short-term particle pollution $PM_{2.5}$.” However, neither the metropolitan area nor the county was ranked listed as one of the worst ozone areas (State of the Air, 2010a and J. Nolen, personal communication, October 11, 2010.)

Review of the EPA’s Enforcement and Compliance History Online database showed one entity in or near the 60402 zip code that was in noncompliance with air quality standards. The Stickney Water Reclamation Plant had three quarters (July 2008 to March 2009) out of compliance in the past three years. However, there were no

current significant violations noted and no formal enforcement actions in the past five years (Enforcement and Compliance History Online (ECHO), 2010).

Research Question 3 (Possible Interventions)

Results from KIQ question 14: What culturally appropriate resources, programs or interventions are needed to enhance access to care, awareness, attitudes, knowledge, beliefs, behaviors to promote cardiovascular health and reduce risk?

Responses to this question fell into three categories and there was no association between the profession of the respondent and the response given. The first area respondents mentioned was a desire for education and awareness programs on cardiovascular health provided to community members. These programs should be interactive instead of lecture, and should be bilingual. Community key informants noted that resources such as the Parent Teacher Association and the Berwyn Public Library are excellent vehicles for dissemination of information. It was also noted that a welcome packet with a list of resources for people new to town would be beneficial.

Secondly, many interviewees felt there was a need for affordable and accessible primary care and preventive disease programs. Suggestions included churches having a parish nurse and a health care entity partnering with schools. Another suggestion from a community outreach worker was the development of a “medical home.” She defined this as a place where a person receives their care and has continuity for preventive care as well as acute care. The cardiologist expanded on this noting that preventive care for lipid, blood pressure, and blood sugar checks is inexpensive. While he operates a clinic

for CVD screening with the BPHD but there are no other clinics like that of which he is aware.

Finally, many respondents felt there was need for increased green space and for outdoor activities such as development of social clubs, intramural sports groups and other structured physical activities for adults and children. The mayor mentioned that having Latinos in leadership roles is important to the success of any program that is developed. The Berwyn Health District president added that finding grants and funding for programs is also very important.

Research Question 4 (Risk Prevalence)

Participants in the individual community member health screenings were split between three sites (St. Frances of Rome n=45, St. Mary of Celle=41, Berwyn Public Health District=20) for a total sample size of 106. While subjects were screened at different sites, 62% of participants had Berwyn addresses, 30% had Cicero addresses and 8% lived outside of Berwyn or Cicero. The sample was split by gender (male= 42, female=64). The mean age of the population was 46.1 ($SD \pm 13.1$).

Data generated by the screenings included age, systolic and diastolic blood pressure (SBP and DBP), height, weight, body mass index (BMI), total cholesterol (TChol), high density lipoprotein (HDL), and glucose (see Table 10). Variables with the largest sample size were age, SBP, DBP, height, weight and BMI. Mean SBP was 120.9 mmHg and this was the same for men and women. Mean DBP was 75.7 mmHg. For men, specifically, mean DBP was 77.1 mmHg which was higher than women's DBP which was 74.7 mmHg. The mean BMI was 29.7($SD \pm 6.6$) for the entire sample and

29.2 ($SD \pm 5.0$) for men and 30.1 ($SD \pm 7.6$) for women. Serum glucose level mean for the sample was 104.6 ($SD \pm 29.5$). For men mean glucose level was 110.3 ($SD \pm 38.1$) and for women 100.8 ($SD \pm 21.3$). With regard to smoking 70 people responded to the question. Of this sample six reported smoking (five men and one woman).

In order to determine the proportion of participants with abnormal risk variables, parameters from accepted guidelines with risk cut-offs were used to calculate prevalence of those with values considered “at risk” (see Table 11). Age as a risk factor was quantified as “over 65 years” and 8% of subjects had this risk factor. Systolic hypertension was divided into “pre hypertension (SBP 120-139 mmHg)” and “systolic hypertension (SBP \geq 140 mmHg)”. Of the study sample 35% had prehypertension and 16% had hypertension.

Overweightness and obesity were measured by BMI. Forty-five percent of subjects were found to be overweight and 38% were found to be obese. Glucose values \geq 100 mg/dL were considered abnormal and 44% of the subjects had an abnormal glucose value.

Research Question 5 (Risk Stratification)

Of the 106 subjects enrolled in the study, 45 had sufficient data to calculate a Framingham Risk Score. The only variable missing in the calculation was whether the blood pressure assessed was a “treated” or “non-treated” blood pressure. “Treated” means that the person was being treated with anti-hypertensive medications versus “non-treated” meaning that the person was not being treated with anti-hypertensive medications. Because this variable was not captured, an analysis was run using a case

scenario where the assumption was “all blood pressures were treated” and another analysis was run using the same subjects with the assumption that “no blood pressures were treated.” It should be noted that these conventions of “all” or “none” are artificial. If the “treated” or “non-treated” variable was available there would likely be a blend of “treated” or “non-treated” subjects. Once scores were calculated using both scenarios, ten year absolute risk score was categorized into >20%, 10-20%, 6-9% or 0-5% (see Table 12). Based on these stratifications there were no subjects with high (>20%) risk and three subjects with a medium (10-20%) risk. The remaining subjects were at low (<10%) risk.

Research Question 6 (Associations between Health Determinants and Risk)

There are no results for this question as insufficient data was gathered to determine any relationship between social and physical health determinants and level of individual cardiovascular risk. This will be further reviewed in the discussion on study limitations in Chapter Five.

Table 10. Health Screening Results

Variable	Total				Men				Women			
	N	Mean (<i>SD</i>)	Min	Max	N	Mean (<i>SD</i>)	Min	Max	N	Mean (<i>SD</i>)	Min	Max
Age (years)	106	46.1 (13.1)	21	89	42	46.6(10.4)	21	66	64	45.7(14.7)	22	89
SBP (mmHg)	103	120.9 (15.2)	90	162	42	120.9(11.9)	100	144	61	120.9(17.2)	90	162
DBP (mmHg)	103	75.7 (9.0)	50	100	42	77.1(8.0)	60	90	61	74.7(9.5)	50	100
WT (lbs)	104	171.6 (38)	98	315	42	184(28.9)	134	249	62	163.3(41.3)	98	315
HT (inches)	104	63.8 (3.9)	52.5	75	42	66.8(2.7)	58	73	62	61.9(3.1)	52.5	75
BMI	103	29.7 (6.6)	19	52	42	29.2(5.0)	21	46	61	30.1(7.6)	19	52
TCHOL (mg/dL)	61	192.0 (43.3)	106	324	27	187.1(45)	106	296	34	196(42.2)	143	324
HDL (mg/dL)	47	42.2 (12.2)	16	76	22	39.1(10.6)	26	68	25	46.8(12.5)	16	76
Glucose (mg/dL)	104	104.6 (29.5)	74	289	42	110.3(38.1)	74	289	62	100.8(21.3)	77	203
Smoking (%)	6	9	0	100	5	16	0	100	1	3	0	100

SBP = systolic blood pressure, DBP = diastolic blood pressure, Wt = weight, Ht = height, BMI = body mass index,
TCHOL = total cholesterol, HDL = high density lipoprotein

Table 11. Prevalence of Persons with Risk Factors at Health Screenings

Risk Factor	Prevalence
Age (>65 years) ^a	8%
Systolic Pre- Hypertension (120-139 mmHg) ^b	35%
Systolic Hypertension I and II (\geq 140 mmHg) ^b	16%
Diastolic Pre-Hypertension (80-89 mmHg) ^b	32%
Diastolic Hypertension I and II (\geq 90 mmHg) ^b	7%
BMI (25-29.9) ^c overweight	45%
BMI (\geq 30) ^c obese	38%
TChol (>200mg/dL) ^d	33%
HDL (<40mg/dL men) ^d	52%
HDL (<50mg/dL women) ^d	25%
Glucose (\geq 100mg/dL) ^e	44%
Smoking ^a (has smoked in past 30 days)	9%

^a Kannel, W.B., Dawber, T.R., Kagan, A., Revotskie, N., & Stokes, J. (1961). Factors of risk in the development of coronary heart disease – six year follow up experience. The Framingham Study. *Annals of Internal Medicine*, 55(1), 33-50.

^b Chobanian, A.V., Bakris, G.L., Black, H.R., Cushman, W.C., Green, L.A., Izzo, J.L. et al. (2003). The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: The JNC 7 Report. *Journal of American Medical Association*, 289(19), 2560-2571.

^c National Heart Lung and Blood Institute in Cooperation with The National Institute of Diabetes and Digestive and Kidney and Diseases (1998). Clinical Guidelines on the Identification, Evaluation and Treatment of Overweight and Obesity in Adults: The Evidence Report. NIH Publication 98-4083.

^d The Third Report of the National Cholesterol Education Program (NCEP) Adult Treatment Panel (ATP III) Executive Summary, National Institutes of Health (2001). (NIH publication 01-3670-2001).

^e American Diabetes Association (2010). Diagnosis and treatment of diabetes mellitus. *Diabetes Care*, 33(S1), S62-S69.

Table 12. Framingham Risk Stratification

		Total		Men		Women	
10 year absolute risk		If BP not treated	If BP treated	If BP not treated	If BP treated	If BP not treated	If BP treated
Low	0-5%	36	31	16	14	20	17
	6-9%	6	11	5	7	1	4
Medium	10-20%	3	3	1	1	2	2
High	>20%	0	0	0	0	0	0
Total “N”		45	45	22	22	23	23

BP not treated = assumed no one in group is take antihypertensive medicines for elevated BP
 BP treated = assumed everyone in group is take antihypertensive medicines for elevated BP

Summary

Social and physical health determinants that influence CVD were evaluated in this study. Results from key informant interviews and individual community member surveys provided qualitative information about social and physical health determinants. These determinants included language barriers, access to care, cultural behaviors, and awareness of CVD, availability of parks and play lots, grocery stores and environmental pollution. Interview and survey findings were supplemented with internet database search results which rounded out the picture of social and physical health determinants in Berwyn, Illinois.

A quantitative risk assessment was completed using a small convenience sample of adults of Mexican descent who attended community health screenings. Measures of risk for CVD such as blood pressure, body mass index, total cholesterol level, high density lipoprotein level, and glucose level were quantified. In addition, current risk cut-off levels were used to determine prevalence of CVD risk factors in this sample. Using the Framingham Risk Calculator the ten year absolute risk for CVD event was calculated,

Based on these stratifications there were no subjects with high ($>20\%$) risk and three subjects with a medium ($10\text{-}20\%$) risk. The remaining subjects were at low ($<10\%$) risk. Inadequate data was collected (only 45 complete data sets) to determine a relationship between social and physical health determinants and individual risk. The following chapter is a discussion of these results.

CHAPTER FIVE

DISCUSSION

The purpose of this study was to increase understanding of health determinants and risk factors which contribute to cardiovascular health and risk in people of Mexican descent in Berwyn, Illinois. The rationale for the study was to lay the ground work for future interventions to reduce the risk of CVD in this population. The discussion includes a review of the social and physical health determinants as well as risk factor prevalence; address the limitations of the research; and recommendations for future research; including ideas for interventions to improve cardiovascular health in this community.

Social Health Determinants

Social health determinants are part of the Healthy People 2010 model used as the framework for this investigation. Recently the Healthy People 2020 guidelines were published and there is a renewed focus on social health determinants. While social health determinants were part of the Healthy People 2010 model, the Healthy People 2020 document includes specific objectives for social health determinants over the coming years.

Social health determinants examined in this study included awareness and attitudes about CVD, access to health care, cultural influences on health beliefs including assessment of potential language barriers, and socioeconomic status. The first research

question asked was: “Are there social environmental factors that affect knowledge, attitudes, beliefs and health-related behaviors related to cardiovascular health/disease among people of Mexican descent?”

To answer this question it was thought necessary to determine if people of Mexican descent were concerned about CVD. Results of key informant and individual community member interviews reflect that CVD does not rank as one of the top three “overall” concerns for people of Mexican descent. Data reflected that the “greatest concern” for people of Mexican descent was anything to do with a person’s financial situation such as jobs, the economy, housing, and family including immigration status, and safety. It is not clear that any of these reported concerns are unique to people of Mexican descent with the exception of immigration status and language barriers that were frequently mentioned as areas of concern. However, concerns about finance and family were paramount among all respondents.

These findings were somewhat different than Puente’s findings in 2002 where she found the top three concerns of Latinos in Berwyn and Cicero were (1) education, (2) political representation, and (3) health care and children/youth (tied). It may not be surprising that the current findings differ from Puente’s findings in 2002 since the global economic downturn has certainly reordered the concerns of communities around the world and they are now more “financially” focused.

Another approach to determining level of “concern” in this community was part of the development of the Family Strengthening Program at the St. Mary of Celle Family Center in Berwyn. Rocotello (2007) surveyed community members in Berwyn and

Cicero about their interest in program topics at the center. While this survey was not limited to Latinos, over 40% of the respondents spoke Spanish, so it is likely that at least 40% were Hispanic. Of this survey the top three “programs of interest” were (1) violence prevention, (2) physical wellness, and (3) nutrition. “Health referrals” and “health risk information” came in 8th and 11th (last), respectively. This survey did not ask about “concerns” but instead about educational programs, however, “physical wellness” and “nutrition” did rank high. It should be noted again that this data was gleaned well before the global economic downturn, therefore, “financial concerns” found in the current study may not have been as high as “physical wellness” and “nutrition” in Rocotello’s work. An interesting incidental finding in the current study is that community health screenings were very well attended by people of Mexican descent and there appeared to be great interest and openness to learning about healthy behaviors. These screenings were free. So it may be that people of Mexican descent do have concern about health and wellness but this becomes secondary when there are financial challenges.

In the current study when subjects were asked specifically about “health” concerns, CVD ranked a distant second to diabetes. However, these same subjects ranked CVD as the number one cause of death in people of Mexican descent. It is troubling that CVD only ranked second as a health concern among interviewees, while seemingly being acknowledged as the number one cause of death. Diabetes, nonetheless, did rank first as a health concern and diabetes is also common in this population, in addition to being a CVD risk equivalent. Interestingly, in Mexico diabetes is the number one cause of death, so the impression of diabetes as a number one health concern could

be valid for those who are recently emigrated from Mexico (Pan American Health Organization, 2007).

Another reason that diabetes may have ranked first is that diabetes also presents several physical manifestations that are obviously evident of bad outcomes. For example, limb amputation and blindness are more visually recognizable than the experience of having shortness of breath or high blood pressure. Practically, certain health behaviors such as exercise and eating a healthy diet, are important for both diabetes prevention and CVD prevention. Therefore, someone recognizing CVD or diabetes as the number one cause of death may not be as important as recognition and practice of preventive behaviors which could be applied to both diseases.

“Concern” and “awareness” are different constructs. An assumption of this study was that without “awareness” of a problem one cannot have “concern” about it. Therefore, if these subjects are not “aware” of health behaviors and risks for CVD, then they cannot have “concern” about it.

Earlier studies (Wagner, Lacey, Abbott, de Groot, Chyun et al., 2006) demonstrated that Latinos typically had less awareness of CVD than non-Latinos. More importantly, while awareness of the disease is important, it is also important for a person to have awareness of the behaviors that contribute to CV health and disease. Having awareness of unhealthy and healthy behaviors is the starting point to being able to modify unhealthy behaviors and support healthy behaviors.

The influence of culture on cardiovascular health/disease was also evaluated. In this study complimentary alternative medicine (CAM) and language were specifically

examined as indicators of cultural influence. CAM appears to be a play a role in the lives of people of Mexican descent in Berwyn according to key community informants. While *curanderos* are widely discussed in the literature, there was little mention of them in the individual interviews. However, it should be noted that individual community members were not specifically asked about the use of CAM.

When community key informants discussed CAM it was primarily discussed as the use of remedies for ailments passed down through generations. The use of *curanderos* was noted by key informants. It would be valuable to probe this issue more closely with individual community members to get to the root of their beliefs and to validate this finding. Key informants expressed that people of Mexican descent in Berwyn have beliefs consistent with that found in the literature about CAM and traditional modern medicine. In other words, they blend CAM and modern medicine. To get more detailed data about this it would probably require one on one interviews or discussion in focus groups, as it is challenging to obtain such personal data in a mass health screening environment. This would be helpful to know because health care providers would be better able to accommodate CAM with conventional medical care if they understood its use in this population.

The other variable representing culture is lack of fluency in English language and this was noted to be a barrier by all participants. Some respondents perceived language as more of a barrier than others. Bilingual services are variable throughout Berwyn's health care community. However, it is clear that primarily Spanish speaking individuals in Berwyn are more inclined to use health services that provide a clear and demonstrable

bilingual program and are geared toward Spanish speakers such as the LIDERr Program (Latino Instruction for Diabetes to Empower and Reduce Risks; a diabetes management program focused on Hispanics) offered through MacNeal Hospital.

Using the Healthy People 2010 and 2020 models as guides, the goal for 2010 was to increase the proportion of local health departments that have established culturally appropriate and linguistically competent community health promotion and disease prevention programs in the area of heart disease and stroke. The target was to increase the proportion of health departments with these programs from 28% (the status as of 1996-1997) to 50% (U.S.DHHS, 2000, pp.7-23). Interestingly, for Healthy People 2020, this particular objective is only listed as a “developmental objective” and no current baseline or projected goals are listed. Currently, the Berwyn Public Health District does not provide this type of program. However, the medical director of the program recognizes the need and is a strong advocate for culturally appropriate programs and increased access to preventive care for all individuals.

The last social health determinant, and probably the most influential, is access to health care services ranging from prevention to treatment of CVD. As described in the literature review, access or entry into the health care system can be divided into realized and potential access (Documet & Sharma,2004). Documet and Sharma describe realized access as the presence of actual services or presence of physical facilities to provide health care. Results of interviews from key informants revealed that realized access is adequate. However, potential access, defined by Documet and Sharma as enabling

resources for health care utilization, such as insurance or a regular source of care, are lacking.

The Healthy People 2010 and 2020 models address the question of potential access by setting goals for health care access that include increasing the proportion of persons with health insurance and increasing coverage for clinical preventive services. According to Healthy People 2020, the baseline for insurance coverage in the U.S. in 2008 was 83.2% which is vastly different than Puente's (2002) work that described only 54% of Latino's in Berwyn and Cicero having insurance coverage. The objective for Healthy People 2020 is to have 100% of the U.S. population covered by insurance, and this is an important component of the current Health Care Reform Act. Of note, insurance coverage for "preventive services" is also a "developmental" objective in Healthy People 2020. Therefore, while there are no definitive goals for preventive care established in Healthy People 2020, the work group is evaluating it as a possible objective.

Interestingly, there were mixed responses from informants about lack of insurance being a barrier to access to care. The absence of consensus about lack of insurance as a barrier to access could pose problems for future interventions to improve access. The first step to solving a problem is recognizing that it exists. It will be necessary to have a clear global understanding of the status and depth of insurance coverage and its effect on access to care in order to develop solutions or implement policy changes to address these issues.

Interwoven in the complex picture of access is socioeconomic status (SES).

Those interviewed felt that individuals that have money and education have a better understanding of CVD risk and were able to demonstrate better preventive behaviors than those who did not. Interestingly, in 2008 the Institute for Latino Studies at the University of Notre Dame (2008) conducted focus groups with 18 experts in Chicago on issues related to the Chicago Metropolitan Agency for Planning's (CMAP's) planning process. When small groups were asked "Which of the following issue areas are most likely to impact health, given the continued Latino population growth through 2040?", the top two answers were "employment and income" and "education." Each of these are a component of SES.

Although the annual household income for people of Mexican descent in Berwyn is the same or better as the national annual household income (according to the 2000 U.S. Census), it will be imperative that an examination of the SES of people of Mexican descent in Berwyn occur after the 2010 U.S. Census becomes available. The 2010 US Census data is rolling out state by state and not yet available for the state of Illinois. The importance of this is reinforced by Lutsey's (2008) and Gallo's (2009) finding using data from the earlier mentioned MESA study. In their research they found an association between the prevalence of sub-clinical atherosclerosis, i.e., CVD and lower SES. If the national trend of lower SES for people of Mexican descent remains, then the potential for worsening risk for CVD will become increasingly worrisome.

Finally, "lack of a medical home" was a consistent finding from the key informant interviews. The concept of a medical home is defined as "having a regular provider, who

provides total care, fosters patient engagement in care, and offers easy access to care” (Beal, Hernandez & Doty, 2009, p. S514). The idea of a medical home is consistent with the goals set forth by Healthy People 2020. These goals include increasing the proportion of persons who have a specific source of ongoing care (to 95%) and a usual primary care provider (to 83.9%) as well as reducing the proportion of families that experience difficulties or delays in obtaining health care or do not receive needed care for one or more family members.

Community key informants citing lack of a medical home was consistent with current literature on barriers to access to care. Beal and colleagues (2009) sought to find if there were Latino subgroup variations in having a medical home and to identify factors associated with Latinos having a medical home. By looking at 24,000 adults (Latino = 6,200) in the 2005 Medical Expenditure Panel Survey, they found that while 57.1% of non-Hispanic whites reported having a medical home, only 35.4% of Mexican Americans reported having a medical home. Not surprisingly, regression analysis demonstrated that having private health insurance was a predictor of having a medical home amongst Latinos.

While cardiovascular outcomes for people of Mexican descent with or without a medical home have not been studied, Gonzalez (2009) examined awareness and knowledge about diabetes among Latinos who have diabetes and do not have a medical home. First, he found that Mexican Americans had the lowest rate of “having a usual source of health care” (59.7%) compared to other Latino subgroups that ranged from 61.9% to 77.4%. Next, regression analysis demonstrated that having a usual source of

health care was associated with significantly higher diabetes awareness and knowledge (OR=1.24; 95% CI=1.05-1.46).

Among people of Mexican descent in Berwyn, the question may be asked “why does this group not have a medical home?” Based on the literature and the findings of this study it is likely multi-factorial. Beal demonstrated that lack of private health insurance is associated with lack of a medical home. Because private health insurance generally requires financial resources or employment, it is clear that people of Mexican descent would be less likely to have a medical home because they often work in jobs in the service sector that do not provide health insurance. While low cost services such as PCC Wellness, Access Health Care and Alivio Medical Center are available, it was the opinion of interviewees that these sources, or potential medical homes, were overloaded with patients and not able to deliver care as a medical home. Moreover, this population tends to not focus on preventative health behaviors and seeks care for acute health problems. This pattern provides limited opportunity for establishing a relationship with a consistent provider, making it difficult to establish a medical home.

Another factor could be the likeliness of not pursuing preventive health behaviors in this population. As discussed in Chapter Four, interviewees reported that “there does not seem to be a connection between the relationships of behavior to disease.” If people of Mexican descent do not participate in preventive health behaviors such as cholesterol testing and routine blood pressure checks, it becomes difficult to establish a medical home. If care is only sought acutely, then the care provider may only interact with the individual during acute illness. The provider then has little knowledge of the individual’s

health history. In addition, the infrastructure of most health care clinics is to have the patient see their primary provider; if the individual has no primary provider then they are likely to see a different provider each time making it impossible to establish a relationship. The worst case scenario is that the individual only seek care through the Emergency Department where one could never establish a medical home.

In summary, social health determinants examined in this study indicate many barriers to attaining and maintaining CV health. From the interviews with key informants and individual community members, CVD does not appear to be the highest “overall” concern or “health” concern in general. Reasons for this can only be speculated but “awareness” of CVD also appears to be lacking and this could be a reason for lack of concern.

This population, like many Mexican American communities, is underserved with regard to health care. While 2000 US Census data for Berwyn does not demonstrate a disparity between people of Mexican descent and non-Hispanic whites in annual household income, there is certainly a disparity in education, employment, and health insurance coverage which all contribute to the primary barrier to CV health which is lack of access. While cultural and language barriers exist, it is probably economic factors that create the greatest barrier and it will be necessary to evaluate the 2010 U.S. Census data to develop the full picture. Without access it is impossible to have a medical home, and the medical home has been shown to be a tremendous facilitator to health and would likely be a facilitator to CV health as well.

Physical Health Determinants

The next research question posed was: “Are there physical environmental factors that affect knowledge, attitudes, beliefs and health related behaviors related to cardiovascular health/disease among people of Mexican descent?” To determine this, an evaluation was done of stores selling fruits and vegetables, availability and accessibility of parks and public transportation as well as assessment of the presence of toxic waste and air pollution.

Grocery stores with adequate fruits and vegetables were abundant in and proximal to Berwyn. Only two areas of Berwyn were outside a .5 mile distance from a store that sells fruits and vegetables. While not mapped, by visual appearance the areas outside of the .5 mile distance are within at least one mile of a store that sells fruits and vegetables. In comparison to national data only 24.1% of Americans live within .5 miles of a grocery and only 33.7% live within .5 to one mile of a grocery. In this comparison Berwyn betters the national averages. While not a measure of the study, it appears that most of these stores (e.g., La Rosita, Fair Share, Berwyn Fruit and Vegetable, and Familial Foods) cater to the preferences of the Mexican population by selling *jicama* and *nopales* and other fruits and vegetables that appeal to this population.

Healthy People 2020 objectives acknowledge and address deficits in healthy food availability. Healthy People 2020 goals seek to increase the number of states that have state-level policies that incentivize food retail outlets to provide foods that are promoted in dietary guidelines. Currently, Illinois does not have such incentives. By implementing public policies on food outlets it is believed that the nation can increase the proportion of

Americans who have access to a food retail outlet that sells a variety of foods, which is a developmental goal for Healthy People 2020.

An interesting finding in the USDA report on Access to Affordable and Nutritious Food (2009) was that “easy access to all food, rather than lack of access to specific healthy foods, may be a more important factor in explaining increases in obesity” (p. v). This current study did not look at the availability of “fast food”, which is typically of lower nutritional content, compared to stores selling fruits and vegetables. However, this may be an interesting comparison for future work.

Another physical health determinant examined was the availability of parks for physical activity. Parks are present and accessible in Berwyn. By visual inspection of the map of all parks in Berwyn (see Figure 4) and useable parks in Berwyn (see Figure 5) it is clear that the majority of the population is within .5 miles of a park. However, the largest park in Berwyn, Proksa Park, is located on Berwyn’s South side where the fewest number of people of Mexican descent live. There is a large range in quality, size and available activities at the other parks. In review of “useable parks” and Table 8 data it was found that many of these other parks were locked or not well maintained, for example, swimming pools without water.

Interestingly, it was observed that very few people were utilizing even well maintained and openly accessible parks. It is unknown why this was the case but possible reasons could be that typically on Saturday afternoons, when the observation occurred, many families are running errands and doing home activities. Another possible reason is that people often will not use parks when they feel their streets and sidewalks

are safe for activities. These speculations were supported by the individual community interviews which noted that most physical activities take place after family commitments are completed.

In addition, most of these parks and facilities are for specific intended uses such as soccer or baseball. These activities usually occur as organized sports or leagues, and while these leagues are available in Berwyn, they may not have been occurring at the time of observation.

Another possibility which could affect park use by people of Mexican descent is that it is a general consensus, although not documented in this study, that the majority of people of Mexican descent live primarily in North Berwyn and the largest, best maintained parks are in South Berwyn. As discussed in the literature review, many individuals draw a distinction between the two sides of town and do not often travel from one side to the other.

While the actual rate of park use is by different segments of the population is unknown, it is clear that this relatively small municipality has at least four major organizations, Berwyn Recreation, Pav YMCA, North Berwyn Park District and the Berwyn Park District, that support the presence of parks and community physical activities. Tax dollars are used to support three of these organizations with the exception of the Pav YMCA which is supported by dues and the national YMCA. This complex infrastructure may lend to continued maintenance and improvement in parks.

Transportation is important for three reasons. First, it is important because it provides a method for people to get to necessary health services as well as to stores that

sell fruits and vegetables. Next, using alternative methods of transportation such as walking or biking, is an opportunity for physical activity and, third, reducing the use of private motorized vehicles reduces harmful carbon emissions in the community.

The population of Berwyn, like many American cities, uses personal motorized vehicles as their primary source of transportation. There were mixed opinions about availability of Pace bus routes, cost of a bus ride, and barriers such as “English only” maps and drivers. Proximity of bus lines appears adequate; however, the lack of timeliness of bus arrivals was a criticism. It is unknown whether this is an accurate observation as this author did not investigate Pace Bus quality reports to confirm or refute this observation. On visual inspection it appears that all major health facilities are on bus routes. However, this may not be important because most individuals have access to personal motorized vehicles.

Alternative transportation methods are a focus of Healthy People 2020. As objectives for Healthy People 2020, development objectives have been outlined for personal transportation. The objectives for 2010 were to increase use of alternative modes of transportation and to have 10.8% of trips made by walking, 3.6% by public transit and 1.8% of trips made by bicycle. However, after 2008 data on alternative modes of transportation was evaluated, it was clear these goals would not be met and they were adjusted. The Healthy People 2020 goals are to have 5.5% (baseline 2008: 5.0%) of trips made by walking, 3.1% (baseline 2008: 2.8%) by public transit and .6% (baseline 2008: .5%) of trips made by bicycle.

The benefits of improving these percentages in Berwyn could be improved health from increased physical activity and improved air quality. In addition, the plan sets a target for walking trips of less than 1 mile to increase from 17% (1995) to 25%. Therefore, Healthy People 2020 includes developmental objective to increase legislative policies for the built environment that enhance access to and availability of physical activity opportunities, which includes community-scale policies, street-scale policies and transportation and travel policies. These measures may include demarcated bike lanes, safe, well lit sidewalks and a thorough assessment of the adequacy of the Pace Bus system.

The last two physical health determinants evaluated were toxic waste and air pollution. Little is known about the presence of toxic waste and its relationship to CVD, however, toxic waste does not appear to be an eminent problem for Berwyn. Air quality, however, is a real problem in Berwyn. While there are no violations cited in the last five years for air quality standards in Berwyn by the EPA, the American Lung Association's position is that the EPA's standards are too lenient (State of the Air, 2010b).

Because this measure of air quality covers all of Cook County, improving this physical determinant is particularly challenging. Berwyn, as a municipality, has little control over the surrounding sources of pollution such as steel mills in Indiana or industrial Chicago. However, another major source of pollution is combustible fuel sources such as cars. Encouraging and facilitating non-motorized sources of transportation and improving emissions of current public transportation resources are measures that could improve local air quality.

When reviewing trending data from 2006 to 2008, even by EPA standards, Cook County has some of the poorest overall air quality in the United States. When measured against the outdoor air quality goal for Healthy People 2020, which is zero percent for the presence of particulate matter and ozone, Berwyn (Cook County) is far from reaching that standard.

Perhaps the only area where a great deal of improvement could be had is in air quality. Unfortunately, this is an area where this community has little influence. Recently, however, the Northern Indiana Public Service Company (NIPSCO) announced as part of a settlement reached between itself and the EPA that it will close its coal-fired power plant in Gary and spend millions of dollars on pollution control technology at its other Northern Indiana plants. “As a result of the settlement, nitrogen oxide emissions should be lowered 35% from current rates and sulfur dioxide emissions lowered by an additional 80%” (heraldargus.com, 2011). This is expected to have a tremendous effect on improvement of air quality in this region.

In summary, the evaluation of these physical health determinants leads one to believe that the physical environment in Berwyn is not a barrier to CV health. There is availability of stores with produce, parks are plentiful and there is an infrastructure to support those parks. However, it should be noted that accessibility to the parks and the quality and size of the parks was variable. Public transportation appears adequate. While there is margin for improvement in these determinants there are no obvious deficits in any except air quality.

Risk Prevalence

One aim of this study was to determine the prevalence of selected CVD risk factors in adults of Mexican descent participating in health screening programs. In order to do that recognized CVD risk factors were evaluated at community health screening events.

Demographics

To assess if this study's subjects had characteristics similar to a recent representation of the U.S. population of people of Mexican descent, the 2005-2006 National Health and Nutrition Examination Survey (NHANES) data set was compared to the study sample (see Table 13). A comparison of demographics for people of Mexican descent was done and it was found that the overall mean age of the 2005-2006 NHANES sample was 38.8 ($SE \pm 0.7$) compared to the study sample mean age which was 46.1 ($SD \pm 13.1$). There was a higher mean age for both men and women in the study sample (see Table 13). The reason for the somewhat higher mean age in the study sample could be that in this region new immigrants often immigrate to directly from Mexico to Cicero, Berwyn's neighboring town. Then, when more financially stable (i.e., older) they move to Berwyn which some consider a more appealing location in part due to better housing and less crime. However, 30% of the study sample had Cicero addresses so this certainly did not explain all the difference in mean age.

The gender split of the NHANES sample was 47% men and 53% women and the study sample gender split was 40% men and 60% women. These comparisons support that the population of people of Mexican descent in Berwyn is similar to that found

nation wide survey with respect to age and gender. In both cases there was a greater representation of women than men.

Risk Prevalence

The prevalence of persons with abnormal risk variables was examined and compared to the 2005-2006 NHANES data.

Body mass index. There is increasing national focus on obesity in the United States and Healthy People 2020 addresses this with a specific focus on BMI. In the current study 83% of the subjects had abnormal BMIs. Forty-five percent of subjects in this study were considered overweight with BMIs >25 and 38% were considered obese with BMIs >30 . The mean BMI was $29.7 (SD \pm 6.6)$. Comparatively, the 2005-2006 NHANES population demonstrated a mean BMI of $28.62 (SE \pm 0.24)$. Therefore, it does not appear that this study's population, with regard to abnormal BMI, is different than the national population.

Healthy People 2020 sets a goal of increasing the proportion of adults who are at a healthy weight from 30.8% (data from 2005-2008) to 33.9% and reducing the proportion of adults who are obese from 34% (data from 2005 to 2008) to 30.6% (healthypeople.gov, n.d.).

In order to achieve this goal, Healthy People 2020 sets objectives for health care providers, schools and the work place to address the issue of obesity. Included in these objectives is that primary care providers regularly assess BMI (53.6% of the time) in adult patients. This would be an increase from doing a BMI assessment 48.7% of the time as reported in 2008 (healthypeople.gov, n.d.). In addition, counseling or education

for obese patients should include weight reduction, nutrition and physical activity.

Again, the obvious barrier for people of Mexican descent is that they typically do not have a primary care provider to assess and counsel them on weight reduction.

Blood pressure. The mean systolic blood pressure for the study population was 120.9 mmHg ($SD \pm 15.2$) which is very similar to the mean systolic blood pressure that the 2005-2006 NHANES population demonstrated which was 119.3 ($SE \pm 0.43$). Looking at men and women separately, they also had comparable means to the national sample (see Table 10 and Table 13).

In the current study, while 35% of subjects had a blood pressure qualified as pre-hypertension, only 16% had a blood pressure qualified as hypertensive. Data from the NHANES 2005-2006 data set showed similar characteristics. Of the NHANES 2005-2006 data set 31% of Mexican Americans were pre-hypertensive and 22% of Mexican Americans were hypertensive (Ostchega, Yoon, Huges & Louis, 2008). However, the Berwyn sample is slightly older than this NHANES sample so this may account for the higher prevalence of people with hypertension.

Healthy People 2020 sets a goal of 26.9% of people over 18 be considered hypertensive (healthypeople.gov, n.d.). The current study's sample has a lower rate than the standard goal set by Healthy People 2020.

Table 13. Summary Statistics National Health Examination Survey 2005-2006

	Total				Men				Women			
Variable	N	Mean (SE)	Min	Max	N	Mean (SE)	Min	Max	N	Mean (SE)	Min	Max
Age (years)	907	38.82(0.72)	20.0	85.0	426	38.09(0.61)	20.0	85.0	481	39.63(0.93)	20.0	85.0
SBP (mmHg)	907	119.3(0.43)	85.3	217.0	426	121.4(0.43)	90.07	205.3	481	117(0.8)	85.3	217.0
DBP (mmHg)	907	68.38(0.4)	0	118.7	426	69.25(0.44)	0	118.7	481	67.42(0.53)	0	106.7
WT (kg)	907	77.34(0.67)	39.2	165.2	426	81.63(0.38)	48.9	165.2	481	72.55(1.09)	39.2	152.5
HT (cm)	907	164.2(0.26)	138.6	194.5	426	169.9(1.9)	153.2	194.5	481	157.9(0.38)	138.6	176.5
BMI	907	28.62(0.24)	16.8	57.1	426	28.18(0.38)	18.1	53.8	481	29.11(0.42)	16.8	57.1
TCHOL(mg/dL)	870	198.8(1.72)	102.0	458.0	409	201.3(1.9)	102.0	458.0	461	195.9(2.99)	108.0	368.0
HDL (mg/dL)	870	51.06(0.79)	21.0	164.0	409	46.75(0.57)	21	164.0	461	55.83(1.17)	27.0	146.0
Glucose (mg/dL)	379	107.2(1.93)	45.0	418.0	179	108.8(3.76)	45.0	414.0	200	105.3(2.74)	68.0	418.0
Smoking (%)	906	19.05(1.15)	0	100	426	26.54(2.26)	0	100	480	10.7(1)	0	100

SBP = systolic blood pressure, DBP = diastolic blood pressure, Wt = weight, Ht = height, BMI = body mass index, TCHOL = total cholesterol, HDL = high density lipoprotein

Blood glucose. The mean blood glucose level in the study population was 104.6 mg/dL ($SD \pm 29.5$) which is consistent with the national average for this demographic (107.2 mg/dL [$SE \pm 0.79$]). In the current study 44% of subjects had a blood glucose level ≥ 100 mg/dL. However, it is challenging to know what to make of this statistic. While subjects were asked to fast for at least two hours prior to the assessment, this could not be verified. Also, the number of people with diabetes in this sample is unknown, as a thorough medical history was not obtained. However, it has been well established in the national large national data pools such as NHANES, that people of Mexican descent do have a high prevalence of pre-diabetes and diabetes.

These findings may also be indicative of a large population of pre-diabetics. While some of the other risk factors, like hypertension, may emerge later in life elevated fasting glucose levels or pre-diabetes can even be seen in children who are over weight. Therefore, these abnormal glucose levels can viewed as an early warning sign of diabetes and CVD. Because diabetes is a cardiovascular risk equivalent elevated glucose levels in this population would be particularly disturbing if, indeed, these were accurate, fasting blood glucose levels.

Smoking. Tobacco use, more specifically smoking, does not appear to be a prevalent risk factor among persons surveyed. Only nine percent of the surveyed people of Mexican descent reported smoking, which is below the national average (19.05% [NHANES 2005-2006]) and below the Healthy People 2020 goal of 12% (healthypeople.gov, n.d.). However, the convenience sample for this study is probably a more health conscious group of individuals since they were identified at a health

screening event and, therefore, less likely to smoke, which is a widely known risk factor. Nonetheless, people of Mexican descent are overall less likely to adopt the habit of smoking, which is a heavily weighted risk factor.

Illinois's legal action to ban smoking in all public places is an extremely effective measure to reach a goal of smoke free community. This certainly weighs to their advantage and while smoking cessation programs may not be the highest ranked initiative, programs geared to maintaining this culture of non-smoking, especially focused on children, are certainly important and consistent with Healthy People 2020's goal of reducing the initiation of tobacco use among children and adolescents.

Cholesterol. The mean total cholesterol in the study sample was 192.0 ($SD \pm 43.3$) compared to 198.8 ($SE \pm 1.72$) in the 2005-2006 NHANES population. The mean of both samples approximates each other despite the study sample being older. Of the study sample 33% of subjects had a total cholesterol > 200 mg/dL. Interestingly, this is higher than the NHANES 1999-2006 data that demonstrated 21.8% of Mexican Americans having a total cholesterol > 200 mg/dL (Fryar, Hirsch, Eberhardt, Yoon & Wright, 2010). Again, the study sample was a convenience sample so no valid comparison can be made.

There could be many reasons for the differences between Berwyn and the national average. However, high BMI does not appear to contribute to the disparity in prevalence of hypercholesterolemia because the Berwyn population mean BMI closely approximated the NHANES sample. However, the Berwyn population is older and this could contribute to the higher cholesterol levels. In addition, there could be errors in obtaining

the samples for the study. As noted earlier, the challenge of determining fasting versus non-fasting blood samples was encountered. Regardless of the difference in the national average, Berwyn has a large population of individuals with abnormal total cholesterol which contributes to their risk of CVD.

High BMI is an independent CVD risk factor. However, to complete the CVD risk profile for the study population the addition of having an atherogenic diet and lack of physical activity were evaluated through key informant interviews.

Diet. Community key informants cited that “poor diet” was the primary risk factor for CVD in this population. What constitutes “poor diet” was not addressed in this study; however, key informants cited volume of food and food preparation (frying) as the primary culprits. Interestingly, key informants did cite that there is a knowledge deficit in the community and no apparent connection in the community between “food” and “health.” Healthy People 2020 also sets forth very specific goals for increasing the contribution of specific foods to the American diet including fruits, vegetables, whole grains and calcium rich foods while reducing consumption of solid fats, saturated fats and added sugars.

In turn, objectives addressed in Healthy People 2020 include increasing the proportion of physician office visits that include counseling or education related to nutrition or weight. Specifically, for patients diagnosed with CVD the goal is to increase the proportion of physician office visits made by patients that includes counseling or education related to diet and nutrition to 22.9% (currently 20.8%). All physician visits should include nutrition counseling with a goal that this occurs in 15.2% of the

population (currently 12.2%) (healthypeople.gov, n.d.). A developmental objective is to increase the proportion of worksites that offer nutrition or weight management classes or counseling. One should note that while current assessment of these objectives and projected goals is probably well above the current status for people of Mexican descent.

Physical activity. Lack of physical activity or sedentary lifestyle is a contributing factor to high BMI and an independent risk factor for CVD. Risk prevalence of sedentary lifestyle was not measured quantitatively in this study but key informants stated that people of Mexican descent had a sedentary life style. While their jobs may require physical labor, as adults, they did not commonly participate in physical exercise and this is consistent with the National Health Interview Survey (2006) data that revealed only 22.6% of Mexican Americans participate in regular leisure-time physical activity defined as light to moderate activity for ≥ 30 minutes, 5 times per week; or vigorous activity for ≥ 20 minutes, ≥ 3 times per week.

Reviewing the data from interviews in combination with quantitative results (BMI) an impressive triad of risk factors emerged. While BMI, atherogenic diet and lack of physical activity stand alone as CVD risk factors, they are uniquely interrelated in this community. While this may dramatically increase the risk of CVD for people of Mexican descent it may also stream line targeted behavior modification efforts because the risk factors are strongly dependent on one another.

Cardiovascular Disease Risk Ranges

The prevalence of being high, medium or low risk for CVD in adults of Mexican descent participating in health screening programs was summarized in Table 12. These categorizations were based on only 45 subjects. Most individuals fell into the low risk categories and this is not surprising. It is important to note that the Framingham Risk Calculator (FRC) may underestimate the true lifetime risk of a CVD event for a young population. As Lee (2010) writes, “while the majority of people of a relatively younger age are defined as low risk using existing risk algorithms, a low short-term risk in younger subjects may not reflect true lifetime risk” (pp. 163-164).

The assessment of risk for this study also did not take into account the diagnosis of diabetes. Diabetes is a coronary risk equivalent, so while the subject may fall into a low risk category using the FRC, this is invalid because with a diagnosis of diabetes one has at least a >20% absolute risk of CVD event in the next 10 years. Because a complete health history was not obtained on subjects, an underestimation of the prevalence of diabetes may exist which would lead to an underestimation of cardiac risk burden in the population.

Possible Associations between Health Determinants and Risk

This researcher attempted to answer: “What association, if any, is there between Framingham risk category and selected social environmental factors among adults of Mexican descent in health screening programs?” However, this question was left unanswered because sufficient data to make an association was not obtained.

Nonetheless, it is important to reiterate the findings in two papers that looked at acculturation and CV risk factors. First, Etnyre (2006) found no correlation between level of acculturation and CV risk factors and second, Eamranond (2009) found poorly controlled LDL was associated with lower levels of acculturation. Jurkowski and Johnson (2005) established that acculturated Mexican Americans had a four times greater odds of having health insurance. Therefore, one might conclude that the social determinant of health insurance coverage/access could have associated with poorly controlled risk factors. While not looked at in this paper it would be an interesting question for future work.

The associations that would have been established if this data had been collected would only have been exploratory, as the overall sample size was inadequate to perform a correlational analysis. In future research it may be interesting to conduct a large scale risk calculation for this community and do a correlational analysis on the social and physical health determinants discovered in this research project. However, that would require a much larger sample size than the one obtained for this pilot study.

Limitations

Limitations to this study have been pointed out throughout this chapter. However, it is important to summarize them. The assessment of certain variables thought to represent social and physical health determinants could be viewed as a limitation. It is unknown if all possible social and physical health determinants were represented in this assessment. For example, while language was evaluated as a specific barrier to CV

health, literacy was not. There is abundant data demonstrating that being illiterate can affect health but this was not examined in this study.

Upon evaluation of key informant interviews it should be noted that only five of the 15 interviewed were Hispanic. One might question whether the non-Hispanic informants could truly have knowledge of the Hispanic world view. However, it was believed that the non-Hispanics had a depth and breadth of experience with the community that substantiated the validity of their opinions. Examples of this were individuals working in a service or health care setting where nearly 100% of the clients were Hispanic. The ethnicity of the non-Hispanics may still threaten validity but it is believed that this was attenuated by their exposure within the community.

With regard to risk factor prevalence determination, the primary limitation was not reaching the intended sample size. The sample size goal for risk factor screening was 200 and only 103 participants were enrolled. And even though 103 individuals were enrolled, not every variable was gathered from each subject. This was the case for the variable of HDL. Without the adequate sample size it could not be stated that prevalence data were truly representative of the target population.

The risk factor assessments (screening events) were not controlled for quality and, therefore, could threaten the validity of the data. Because the intent was to capture “real life” screening data there were no measures to influence screening procedures. Examples of incongruity of data include the variety of methods used for blood pressure measurement (some pressures were taken manually and others with automated blood pressure machines) and the variability in persons performing these measurements from

one site to another. Another example of variability was the data collected on total cholesterol. It was noted by the investigator that at the first screening event the total cholesterol values were consistently less than 150 mg/dL. It is highly unlikely that this data could be accurate. In this case the total cholesterol data for this event was not included in data analysis. However, this finding supports the threat to validity of other potential erroneous data.

An overarching threat to validity was the world-wide economic down turn that occurred during the course of data collection. This financial crisis certainly could be expected to influence the perspectives and subsequent answers of key informants and community members.

Finally, the scope of this study included primarily people of Mexican descent in Berwyn, Illinois. Therefore, generalizability to other populations and communities is limited. However, while the data gleaned from this study is specific to Berwyn it is believed that this study successfully demonstrated an effective model for assessment of social and physical health determinants with a focus on CV health/disease.

The limitation of this type of data collection is that it was a convenience sample and it could be the most motivated individuals, perhaps those in better health, would attend the event. It could also be the case that the sickest individuals attend the events in search of care. In any case, it is impossible to know and this is a limitation of this sample.

Summary

It is clear that further in depth research on each social and physical health determinant and risk factor is necessary to more completely understand CV health and risk in this community. However, this study did provide a snapshot of the social and physical health determinants and risk factors in Berwyn and a starting point for targeted future work. It is the hope that this community can use this data to target efforts to improve CV health for people of Mexican descent in Berwyn.

From a global perspective it was found that using the Healthy People 2010 model (now Healthy People 2020) and assessing social and physical health determinants focusing on CV health/disease can be accomplished in any community and with any target population, regardless of race or ethnicity. While risk factor prevalence may vary somewhat between geographic location, race and ethnicity it may be that the variance is not significant enough to generate targeted interventions. The risk factor data from this study was similar to the NHANES data that is widely available. Community health screenings may be a good tool for a “teachable moment”, however, resources focused on community screenings may be misplaced. In other words, nursing and the health care community know Americans, including people of Mexican descent, have a critically high prevalence of risk factors that contribute to CVD. Therefore, it may be that social and physical health determinants should be the target for future risk reduction efforts.

In 2011, the focus on social health determinants was the topic of a roundtable discussion broadcast on theheart.org. Dr. Clyde Yancy, Immediate Past President of the American Heart Association, reviewed with Dr. Vivian Rambihar and Dr. Elizabeth Ofili

the renewed focus on health determinants in light of evidence that disparity in risk and disease persist beyond physiologic explanation (Yancy, 2011). The discussants advocated for health care providers to include in their assessment of the patient, the social health determinants that may influence their state of health and disease. In addition, they recommended addressing disparities with community wide initiatives that could improve social health determinants and, ultimately, health.

Future Work

The success of this research and the collaborative relationships forged in the development and implementation of this research contribute to the growing body of evidence for community-based participatory research (CBPR). Next steps include examining the work of other CBPR researchers and possibly tailoring their intervention models to the Berwyn community (see Table 14). As a corner stone of CBPR, community feedback on possible interventions was included in the data gathering for the current project. The following is a discussion of potential future projects based on community feedback.

Table 14. Examples of Community Based Participatory Research Work

Researchers	Publication	Paper Description
Kaplan, S.A., Calman, N.S., Golub, M., Ruddock, C., Billings, J.	The role of faith-based institutions in addressing health disparities: A case study of an initiative in the Southwest Bronx. <i>Journal of Health Care for the Poor and Underserved</i> , 2006, 17, 9-19.	A description of a program in the Bronx, NY, to educate community members about health promotion and disease management and to mobilize church members to seek equal access to health care services
Campbell, M.K., Hudson, M.A., Resnicow, K., Blakeney, N., Paxton, A., Baskin, M.	Church-based health promotion interventions: Evidence and lessons learned. <i>Annual Review of Public Health</i> , 2007, 28, 213-234.	A summary of effective church-based health programs that include health interventions that incorporate spiritual and cultural contextualization primarily focusing on the black community.
Belcazar, H., Alvarado, M., Hollen, M.L., Gonzalez-Cruz, Y., Peregon, V.	Evaluation of <i>Salud Para Su Corazon</i> (Health for Your Heart) – National Council of La Raza <i>Promotora</i> Outreach Program. <i>Preventing Chronic Disease: Public, Health Research, Practice and Policy</i> , 2005, 2(3), 1-9.	A description of a program sponsored by the NHLBI and the National Council of La Raza to pilot test their community-based outreach program <i>Salud Para Su Corazon</i> (Health for Your Heart), which aimed to reduce the burden of morbidity and mortality associated with CVD among Latinos.
Taylor, E.F., Cunningham, P., McKenzie, K.	Community approaches to providing care for the uninsured. <i>Health Affairs: Market Watch</i> , 2006, W173-W182.	A description of local strategies in the Community Tracking Study sites, focusing on efforts that go beyond traditional safety-net access for uninsured people.
McQuiston, C., Parrado, E.A., Martinez, A.P., Uribe, L.	Community-based participatory research with Latino community members: <i>Horizonte Latino. Journal of Professional Nursing</i> , 2005, 21(4), 210-215.	A demonstration of how experiential learning of community members as research participants provided culturally grounded insights used in grant writing. The experiences and involvement of the community researchers shaped the research questions and provided the major conceptual basis in response to a NIH request so for applications.

Researchers	Publication	Paper Description
Larson, C.O., Stroebel, C.K., Perkey, B.N.	Merging education with measurement: A focus on the Hispanic community. <i>Journal of Ambulatory Care Management</i> , 2001, 24(3), 27-36.	A description of a cost effective survey system that measured health status, health needs and provided individualized health feedback and education to Hispanic residents focusing on the importance of culturally and linguistically appropriate community-based initiatives.
Kelley, M.A., Baldyga, W., Barajas, F., Rodriguez-Sanchez, M.	Capturing change in a community-university partnership: The <i>Si Se Puede</i> Project. <i>Preventing Chronic Disease: Public Health Research, Practice and Policy</i> , 2005, 2(2), 1-12.	A description of a project to prevent and control diabetes in a Latino community. In addition a presentation of practical methods for addressing some challenges to evaluation and using data sources that often may be overlooked.
Kim, S., Flaskerud, J.H., Koniak-Griffin, D., Dixon, E.L.	Using community-partnered participatory research to address health disparities in a Latino community. <i>Journal of Professional Nursing</i> , 2005, 21(4), 199-209.	A description of a CBPR study in Los Angeles, CA that trained lay health advisors (LHAs) to provide health education to members of their own community. This includes a needs assessment, community member recruitment to function as LHAs and implementation of the outreach and education activities.
Crist, J.D., Escandon-Dominguez, S.	Identifying and recruiting Mexican American partners and sustaining community partnerships. <i>Journal of Transcultural Nursing</i> , 2003, 14(3), 266-271.	A description of how community partners were identified and recruited and how community partnerships have been sustained during a program of study designed to eliminate health and use disparities. Researchers worked with elderly Mexican American participants and their care givers.

When study participants were asked “Is there a perceived need for interventions in the community to enhance cardiovascular health?”, it was not surprising to find that affordable and accessible primary care was thought to be desperately needed. Many thought having a medical home and the accessibility to the medical home was paramount. While it is unclear how many of people of Mexican descent have a primary care provider or medical home, the general consensus was that most do not. It was felt by respondents that in order to provide preventive care and timely acute care that establishing a medical home was imperative. Because reasons for lack of a medical home are multifactorial it will take many approaches to address this problem. Approaches will include providing affordable and accessible health care through public policy changes and health care reform. However, public policy and health care reform will most likely continue to exclude persons without lawful presence in the U.S.

A bridge to the idea of a medical home was the suggestion of churches as a venue or conduit for medical services. These ideas echo the literature. There is much written on collaborative faith based partnerships providing health education and services and the idea of a parish nurse is not new. In fact, American Heart Association has a faith-based initiative focused on increasing awareness of CVD and CVD risk.

It was also not surprising to find that community key informants reported that educational programs focusing on CV health were needed in the community. Informants voiced a preference for programs that were interactive. Interview responses were consistent with the literature in that it was imperative that programs be bilingual. Several ideas for possible methods for conveying CVD health information to the public were

mentioned in the interviews, such as using the public library as a source of information and a venue for classes as well as maximizing the potential of the St. Mary of Celle Family Center for classes and activities focused on CV health. The generation of ideas by key informants was thought promising as potential first steps to developing future collaborative education endeavors.

The data gathered in this study gives direction to future targeted interventions. Possibilities for interventions can be found in the literature specific to Hispanics and CVD risk reduction. These interventions include the work of Harralson, Emit, Polansky, Walker, Cruz, and Garcia-Leeds (2007) who developed “*Un Corazon Saludable: A Healthy Heart*.” This is an exercise and education program for low income, urban, Latinas resulted in decreased BMI and blood pressure as well as improvement in depressive symptoms. Another example of an organized targeted behavior modification program was “*Camino por Salud (Walk for Health)*” where Keller and Cantue (2008) constructed a walking program that resulted in a decrease in BMI.

Finally, key informants stressed the need for both increased green space and adequate organized physical activities and sports. Interestingly, assessment of listed parks on the respective websites indicates that green space is adequate in Berwyn. Even after mapping parks the quantity appears adequate. While it is not clear why the key informants felt that green space was inadequate it may be that in their evaluation and experience the quality and the accessibility of parks was less than desirable. It would be beneficial to do a thorough assessment of quality and accessibility of Berwyn’s parks.

The volume of organized physical activities and sports was not assessed in depth, however, a cursory assessment was done (see Table 8). The comment from key informants was that these activities, including membership to the YMCA, was cost prohibitive for many. Therefore, physical activities or leagues that could be underwritten by local businesses or government grants may be an answer in this community.

It is believed that the success of these interventions will hinge on community involvement. Therefore, continued work with the American Heart Association and their programs focused specifically on CVD risk reduction like “Go Red *por tu corazon*” program as well as continued collaboration with the Catholic Charities and work within a local parish will be imperative for establishment of any targeted interventions. Partnerships with these organizations and many of the key informants who were part of this study will be necessary to develop initiatives to improve accessible care not only for people of Mexican descent but for all underserved individuals. The Chicago Metropolitan Agency for Planning as well as the Chicago Council on Global Affairs supports this in their 2008 report that advocates initiatives to increase affordable, accessible, culturally competent care for the Latino population and the expansion of programs and resources that encourage prevention and wellness in Mexican communities. These initiatives will need to be culturally appropriate with specific focus on bilingual communication. Although not explored in this study the limitations of literacy will need to be evaluated and be a focus of future work.

Finally, continued work using the Healthy People 2010 model and 2020 objectives for people of Mexican descent should continue. As discussed earlier, Healthy

People 2020 stresses the importance of social health determinants and this should remain a focus for future work. In addition, Healthy People 2020 also continues to focus on eliminating disparities. Healthy People first started in 2000 with objectives to reduce disparities. Healthy People then sought to eliminate health disparities in 2010 and now, in 2020, the goal is to achieve healthy equity and improve health for all Americans.

The Healthy People working group has also developed a program for States, cities and communities to embrace the Healthy People 2020 objectives and set a plan for moving toward attaining those goals. Using the MAP-IT (mobilize, assess, plan, implement, track) a community can begin to assess, plan and evaluate interventions to improve health. MAP-IT includes tools, data and links to health resources to develop community initiatives.

APPENDIX A

FARMINGHAM RISK CALCULATOR

Estimate of 10-Year Risk for Men

Age	Points	Total Cholesterol	Point by age				
			20 - 39	40 - 49	50 - 59	60 - 69	70 - 79
20 - 34	- 9	< 160	0	0	0	0	0
35 - 39	- 4	160 - 199	4	3	2	1	0
40 - 44	0	200 - 239	7	5	3	1	0
45 - 49	3	240 - 279	9	6	4	2	1
50 - 54	6	≥ 280	11	8	5	3	1
55 - 59	8						
60 - 64	10	Nonsmoker	0	0	0	0	0
65 - 69	11	Smoker	8	5	3	1	1
70 - 74	12						
75 - 79	13						

HDL (mg/dL)	Points	Systolic BP (mmHg)	if untreated	if treated
≥ 60	- 1	< 120	0	0
50 - 59	0	120 - 129	0	1
40 - 49	1	130 - 139	1	2
< 40	2	140 - 159	1	2
		≥ 160	2	3

Point Total 10-year risk (%)

< 0	< 1
0	1
1	1
2	1
3	1
4	1
5	2
6	2
7	3
8	4
9	5
10	6
11	8
12	10
13	12
14	16
15	20
16	25
≥ 17	≥ 30

10 Year risk _____ %

Estimate of 10-Year Risk for Women

Age	Points	Total Cholesterol	Point by age				
			20 - 39	40 - 49	50 - 59	60 - 69	70 - 79
20 - 34	- 7	< 160	0	0	0	0	0
35 - 39	- 3	160 - 199	4	3	2	1	1
40 - 44	0	200 - 239	8	6	4	2	1
45 - 49	3	240 - 279	11	8	5	3	2
50 - 54	6	≥ 280	13	10	7	4	2
55 - 59	8						
60 - 64	10	Nonsmoker	0	0	0	0	0
65 - 69	12	Smoker	9	7	4	2	1
70 - 74	14						
75 - 79	16						

HDL (mg/dL)	Points	Systolic BP (mmHg)	if untreated	if treated
≥ 60	- 1	< 120	0	0
50 - 59	0	120 - 129	1	3
40 - 49	1	130 - 139	2	4
< 40	2	140 - 159	3	5
		≥ 160	4	6

Point Total 10-year risk (%)

< 9	< 1
9	1
10	1
11	1
12	1
13	2
14	2
15	3
16	4
17	5
18	6
19	8
20	11
21	14
22	17
23	22
24	27
≥ 25	≥ 30

10 Year risk _____ %

Framingham Heart Study (2011). Coronary Heart Disease (10-Year Risk). Retrieved February 28, 2011 from <http://www.framinghamheartstudy.org/risk/coronary.html>

APPENDIX B

KEY FINDINGS FROM “*THIS IS HOME NOW: THE STATE LATINO CHICAGO*”

1. Metropolitan Chicago ranks third in the nation in the number of Latino residents and second in Mexican origin residents.
2. Between 1990 and 2003 growth in the number of Latino workers nearly equaled the total number of new jobs created in the region.
3. Between 1990 and 2003 the number of homes owned by Latinos increased by 126,000 (34 % of the total growth in owner occupied homes).
4. Only 53 % of Latino students who enter high school in ninth grade graduate four years later.
5. The vast majority of Latino immigrants are of child bearing years and nearly 30 % of all children under five years of age are Latino. The future impact of young Latinos will be enormous.
6. More than 20,000 Latino immigrants, primarily from Mexico, come to metropolitan Chicago each year. Most are hard working but receive low wages.
7. Latinos have much larger household sizes. Thirty-six % of Latino households have 5 or more members compared to 9 % of non Latino white households.
8. Chicago median income for all households in 2000 was \$52,000 compared to \$44,300 for Latino households.
9. In 2000 the occupations most commonly held by Latinos were production operation, service industry, and laborers/helpers (for Latinas administrative support.)

Ready, T., & Brown-Gort, A. (2005). *The state of Latino Chicago: This is home now*, Notre Dame, IN: Notre Dame, Institute for Latino Studies.

APPENDIX C

KEY INFORMANT QUESTIONNAIRE

Name:
 Profession:
 Date:

Key Informant Questionnaire

KIQ

Introduction:

1. What do you think are the top three issues or concerns among people of Berwyn who are of Mexican descent?

1. _____
 2. _____
 3. _____

2. What do you think are the top three health problems or concerns among people of Berwyn of are of Mexican descent?

1. _____
 2. _____
 3. _____

I am now going to focus the rest of the questions specifically on cardiovascular disease. Cardiovascular disease means diseases of the heart and blood vessels; like heart attack, heart attack, high blood pressure, and stroke.

3. What do you think the community (specifically those of Mexican descent) thinks or feels about cardiovascular disease? How important or not important do you think CVD is to people of Mexican descent?
4. What do you perceive as behaviors or causes of cardiovascular disease in the people of Berwyn who are of Mexican descent? Probe: Can you name three?
5. If a person of Mexican descent wanted more information about their cardiovascular health or had a problem with their "heart health" where would they go? What would they do?

Probes: what are some perceived barriers to receiving information or care?

Lack of health care facilities?
 Lack of or insufficient insurance/public aid?
 Lack of bilingual services?
 Cost of services prohibitive?
 Fear of retribution due to illegal immigration status?

Lack of transportation?
Other?

6. Does being of Mexican descent make a difference in the awareness/attitudes/ knowledge/ beliefs/ behaviors?

Probes:

Is this due to a person being from Mexico?

For example, do you believe many Mexican Americans practice the folk health customs typical of Mexican American culture?

What is the impact of primarily speaking Spanish on awareness of CVD?

7. Does the socioeconomic status (income or education level) of those of Mexican descent in Berwyn have an impact on their knowledge, beliefs or attitudes toward cardiovascular health and disease?
8. The social environment includes schools, state of housing, crime, cultural customs, language and spiritual beliefs. What about the Berwyn community social environment contributes to cardiovascular health?
9. What about the Berwyn community social environment contributes to cardiovascular risk and disease?
10. What type of stressors do think are in this community that may effect the mental health of someone of Mexican descent?
11. Healthy eating is a component of cardiovascular health. Diets high in fruits and vegetables are an important part of this. In the Berwyn community what is the availability, in your opinion, of grocery stores or markets that sell fruits and vegetables?
12. Physical activity is also an important part of cardiovascular health. Do you feel parks, play lots are accessible, clean and safe in Berwyn? Are there other places people of Mexican descent can go to participate in physical activity?
13. What are the modes of public transportation in the community? Are they sufficient to meet the needs of the community?
14. What culturally appropriate resources, programs, or interventions are needed to enhance access to care, awareness, attitudes, knowledge, beliefs, behaviors to promote cardiovascular health and reduce risk?

APPENDIX D

MACNEAL HOSPITAL SCREENING TOOL



Caring for Generations

Follow-Up ☐

Date: _____

Time: _____

Initials: _____

Please Print

Name _____ Sex: ☐ Male ☐ Female

Address _____ Birth Date _____

City _____ State _____ Zip Code _____

Phone Number (____) _____

Are you currently looking for a doctor? ☐ Yes ☐ No

When is the best time to reach you**? _____ AM _____ PM

**Upon signing this consent form you give us permission to contact you if any abnormal results arise.

What type of health insurance do you have? _____

Blood Pressure

Normal Systolic: <120 mm/Hg
 Prehypertension: Systolic: 120-139mm/Hg
 High Blood Pressure: Systolic: >140mm/Hg
 Diastolic <80 mm/Hg
 Diastolic: 80-89mm/Hg
 Diastolic: >90mm/Hg

Total Cholesterol

Desirable (lower risk): <200 mg/dl
 Borderline High (higher risk): 200-239 mg/dl
 High (more than twice the risk as desirable level): ≥240 mg/dl

Glucose Levels*

*for people diagnosed with diabetes
 Pre-Meal: 90 to 130mg/dl
 Post-Meal: <160mg/dl

Glucose (Fasting)

Normal: <100 mg/dl
 Pre-Diabetes: 100-125 mg/dl

Glucose (Random)

Normal <120 mg/dl
 Less than 2 hours since eating
 Normal <140mg/dl

Screening	Result	Staff Initials	Notes
Blood Pressure			
Total Cholesterol			
Glucose (fasting)			
Glucose (random)			
Other (BMI)			
Other (LDL)			
Other (HDL)			

Comments: _____

Health Screenings Consent

I authorize MacNeal Hospital (herein referred to as MacNeal) doctors and employees to provide me with the above named health screenings. I understand that this screening does not substitute for a complete medical examination by a physician. I also understand that this screening will be performed in accordance with the protocols established by MacNeal and the manufacturers of the health screening equipment. I, or my personal representatives, agree to assume all risk of loss and release MacNeal from all liability to me for any injury to my person. I have read, understand and accept the above statement. **An abnormal health screening result does not diagnose a medical problem, but if your result is abnormal, we advise you to seek prompt medical attention from your physician.**

Signature** of Patient or guardian
(Age 18 or older)

Date

3249 S Oak Park Avenue Berwyn IL 60402

1-888-622-6325 www.macneal.com

APPENDIX E

CATHOLIC CHARITIES SCREENING TOOL

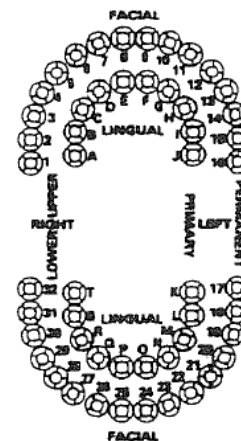
**Catholic Charities of the Archdiocese of Chicago
Screening Form**

Name: _____ Date: _____
 Address: _____ Phone: _____
 Sex: _____ Age: _____
 BP _____ P _____ R _____ T _____ WT _____ HT _____
 Chief Complaint _____ Allergies _____
 History of present illness _____ Medicines _____
 Past Medical History _____
 Past Surgical History _____
 Social history: Tobacco _____ ETOH _____ Drugs _____ HIV _____ TB _____ TD _____
 Family history: Cancer _____ Heart _____ Diabetes _____ HTN _____ TB _____
 Female: LMP _____ Pregnancies _____ Pap _____
 Tests: One Touch _____ U/A:WBC _____ Glucose _____ Blood _____ Protein _____

Review of Systems:

General appearance _____
 Skin _____
 Head & Neck _____
 Eyes _____
 Ears, Nose & Throat _____
 Lymph glands _____
 Chest & Lungs _____
 Heart _____
 Abdomen _____
 Feet _____
 Back & Extremities _____
 Neurological _____
 Psychiatric _____
 Diagnosis/Impressions/Conclusions _____

Treatment Plan _____
 Follow-up _____
 M.D. Signature _____



OUTLINE CARIOUS LESIONS
 SLASH TEETH TO BE REMOVED
 X TEETH MISSING
 NOTE PATHOLOGY / LOCATION
 BLOCK IN FILLINGS PRESENT

I understand that the test results are being given to me for my information only and that Catholic Charities of the Archdiocese of Chicago Health Fair is in no way attempting to propose a diagnosis or recommend medical treatment. The responsibility for initiating a follow-up exam is mine alone, not that of Catholic Charities of the Archdiocese of Chicago, in addition, I hold harmless Catholic Charities of the Archdiocese of Chicago and their staff for any injury or condition resulting from my participation in this screening.

Customer Signature _____ Date _____
 Please take a copy of these results to your doctor, if you don't have one you may contact _____

APPENDIX F

SCREENING PARTICIPANT QUESITONNAIRE

Number: _____

Screening Participant Questionnaire

1. In what year were you born? _____

2. In what country were you born?

(CIRCLE ONE)

United States

Mexico

Other _____

3. If born in Mexico, what state?

(CIRCLE ONE)

Aguascalientes	Guerrero	San Luis Potosí
Baja California	Hidalgo	Sinaloa
Baja California Sur	Jalisco	Sonora
Campeche	Mexico State	Tabasco
Chiapas	Michoacan	Tamaulipas
Chihuahua	Morelos	Tlaxcala
Coahuila	Oaxaca	Veracruz
Colima	Nayarit	Yucatan
Distrito Federal	Nuevo León	Don't know
Durango	Puebla	Refused to answer
Guanajuato	Quintana Roo	Does not apply, was not born in Mexico
	Querétaro	

4. With regard to your heritage, do you consider yourself?

(CIRCLE ONE)

Mexican/Mexicano

Chicano

Mexican American

Other _____ what? _____

5. How many total years have you lived in the United States? _____
(years/months)

Now I am going to ask you questions about health issues that may face people of Mexican descent.

6. What do you think is the greatest health problem facing people of Mexican descent?

7. As far as you know, what is the leading cause of death in people of Mexican descent?

8. Based on what you know, what are the major causes of heart disease?

(NOT NECESSARY TO READ ANSWERS BUT ANSWER MAY BE ONE OF THESE)

A family history of heart disease Aging Being overweight Diabetes Drinking alcohol High blood pressure High blood cholesterol High blood triglycerides Low levels of estrogen	Menopause Not exercising Smoking Stress Stroke Your racial heritage Other Don't know Refused
---	--

9. What do you believe your level of risk is for having heart disease?

Rank your risk from 1 to 10

(1 being no risk of ever having heart disease and 10 being at the highest risk of having heart disease)

(CIRCLE ONE)

1 -- 2 -- 3 -- 4 -- 5 -- 6 -- 7 -- 8 -- 9 -- 10

Now I am going to ask you questions about you and your family's health history.

10. Family History

(CHECK BOX FOR PARTICIPANTS THAT ANSWER THAT THEY HAVE A RELATIVE WITH THIS CONDITION)

Family Member	Heart Attack	Stroke	High blood pressure	Age at occurrence
Mother				
Father				

Sister				
Brother				
Child				
Do not know				
Refused				

11. Have you been diagnosed with or told you had any of these conditions or diseases?
(CHECK APPROPRIATE BOX)

	Yes	No	Receiving treatment (medicines, therapies, advice, doctor's visits)	Not receiving treatment	Don't know
High blood pressure, hypertension			medicine		
			yes	no	
Coronary heart disease, blocked heart arteries, heart attack					
Peripheral vascular disease or poor circulation in the legs or neck (blocked arteries in the legs or neck)					
Diabetes					
Abdominal Aortic Aneurysm (enlarged artery in the belly)					
Stroke					
High cholesterol					

These next questions are about smoking.

12. Have you smoked at least 100 cigarettes in your ENTIRE LIFE?

(CIRCLE ONE)

Yes

No

Refused

Don't know

13. Have you smoked cigarettes in the past 30 days?

(CIRCLE ONE)

Yes

No

Refused
Don't know

The next questions are about physical activities (exercise, sports, physically active hobbies or work) that you may do.

14. Do you regularly engage in strenuous exercise or hard physical labor?
(CIRCLE ONE)

Yes
No
Refused
Don't know

15. Do you exercise or labor at least three times a week?
(CIRCLE ONE)

Yes
No
Refused
Don't know

16. Where do you go to perform physical activity?
(CIRCLE ONE)

Parks or playlots
Gym/YMCA
Sidewalk/street
Home
School
Work
Play sports
I don't exercise

17. How many servings of fruits and/or vegetables do you USUALLY eat per day?
(CIRCLE ONE)

None
1
2
3
4
5
>5
Refused
Don't know

18. When you shop for groceries where to you USUALLY buy fruits and vegetables?
(CIRCLE ONE)

- At a convenience store
- At a large grocery store like Jewel or Dominick's
- At a fruit/vegetable stand
- At a farmer's market
- I grow my own
- I don't buy fruits and vegetables

Where do you go? _____ (name of store)

19. What is your overall level of stress on a scale of 1 to 10
(1 being no stress and 10 being the most stressful life you can imagine).
(CIRCLE ONE)

1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10

20. What is your overall quality of life on a scale of 1 to 10
(1 being the worst life you can imagine and 10 being the best life you can imagine).
(CIRCLE ONE)

1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10

21. Is there a place that you USUALLY go to when you need routine or preventive care,
such as a physical exam or check up?
(CIRCLE ONE)

- Yes
- There is NO place
- There is MORE THAN ONE place
- Refused
- Don't know

22. What kind of place is it – a clinic, doctor's office, emergency or some other place?
(CIRCLE ONE)

- Clinic or health center
- Doctor's office or HMO
- Hospital emergency room
- Hospital outpatient department
- Some other place
- Doesn't go to one place most often
- Refused
- Don't know

What is the name of the place that you go?

23. There are many reasons people delay or avoid getting medical care or preventive or routine care. Have you delayed or avoided preventive or routine care for any of the following reasons?

(CHECK BOX IN APPROPRIATE COLUMN)

	Yes	No	Refused	Don't Know
You couldn't get through on the telephone.				
You couldn't get an appointment soon enough.				
Once you get there, you have to wait too long to see the doctor.				
The (clinic/doctor's) office wasn't open when you could get there.				
The clinic staff did not speak Spanish.				
You didn't have transportation				
Your insurance didn't cover the visit.				
You could not afford the visit.				

24. What is the highest grade or level of school you have completed or the highest degree you have received?

(CIRCLE ONE)

<ul style="list-style-type: none"> • 1st grade • 2nd grade • 3rd grade • 4th grade • 5th grade • 6th grade • 7th grade • 8th grade • 9th grade • 10th grade • 11th grade • 12th grade, no diploma • High school graduate • GED or equivalent 	<ul style="list-style-type: none"> • Some college, no degree • Associate degree: occupational, technical, or vocational program • Associate degree: academic program • Bachelor's degree (example: BA, AB, BS, BBA) • Master's degree (example: MA, MS, MEng, EdD, MBA) • Professional School Degree (example: MD, DDS, DVM, JD) • Doctoral Degree (example, PhD, EdD) • Refused • Don't Know
--	--

25. What is your approximate annual household income?

(CIRCLE ONE)

Less than \$15,000	\$50,001- 55,000
\$15,000 – 20,000	\$55,001- 60,000
\$20,001- 25,000	\$60,001- 65,000
\$25,001- 30,000	\$65,001- 70,000
\$30,001- 35,000	\$70,001- 75,000
\$35,001- 40,000	Greater than \$75,000
\$40,001- 45,000	Refused to answer
\$45,001- 50,000	

26. What is your correct working status?

(CIRCLE ONE)

Working for pay

Not work and looking for work

Not working and not looking for work

Working as a homemaker

Disabled and cannot work

Refused to answer

Other _____

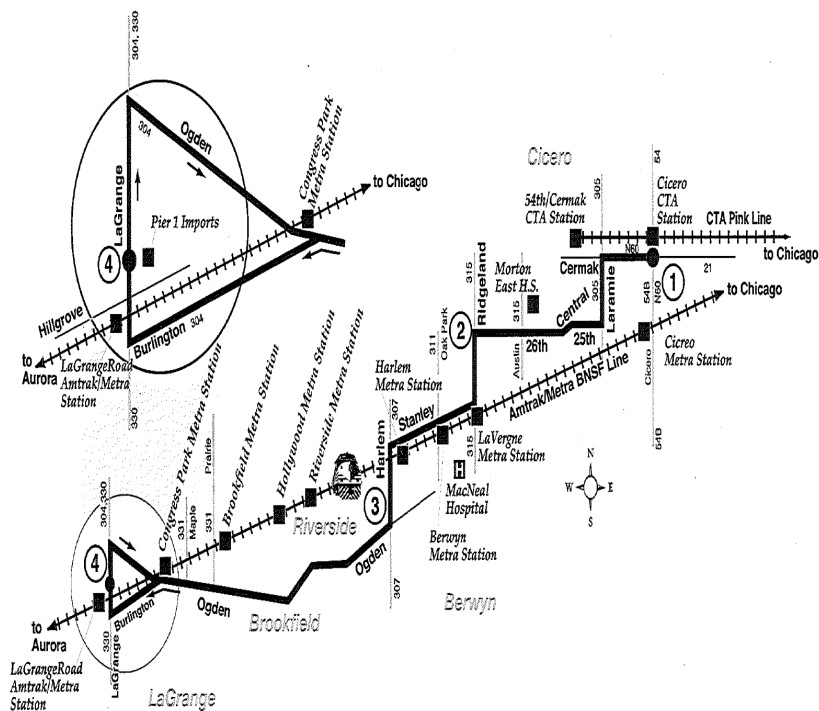
APPENDIX G
PULPIT ANNOUNCEMENT

As you know, the (Annual Health Fair/ Health Care Sunday) is coming up. Free screenings for blood pressure, blood sugar and cholesterol will be available on _____ from _____ to _____ here at the church. For accurate results for the blood sugar and cholesterol tests, please do not eat after midnight. There will also be a special table of researchers collecting information specifically about people of Mexican descent and gathering information about how life style may contribute to heart disease. I encourage you to attend.

APPENDIX H
PACE BUS ROUTES

Route 302

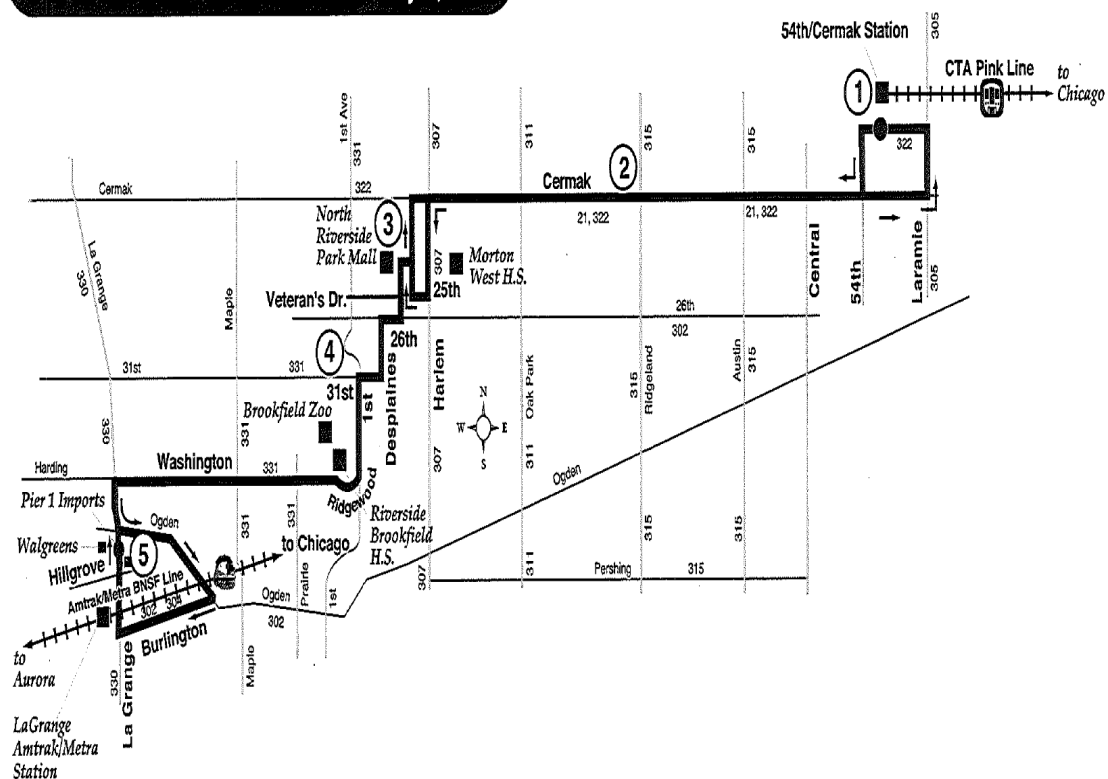
Effective Date
February 8, 2010

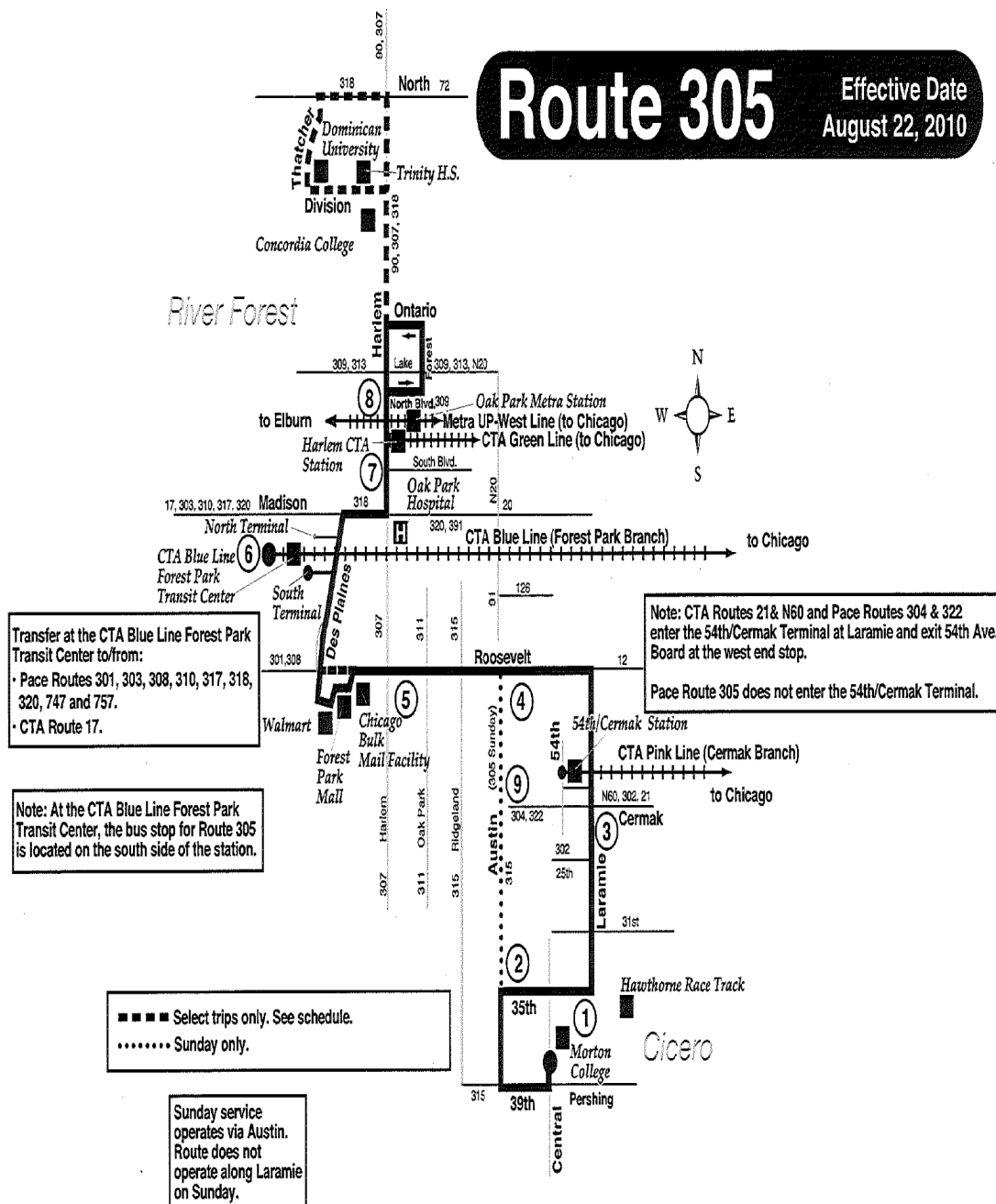


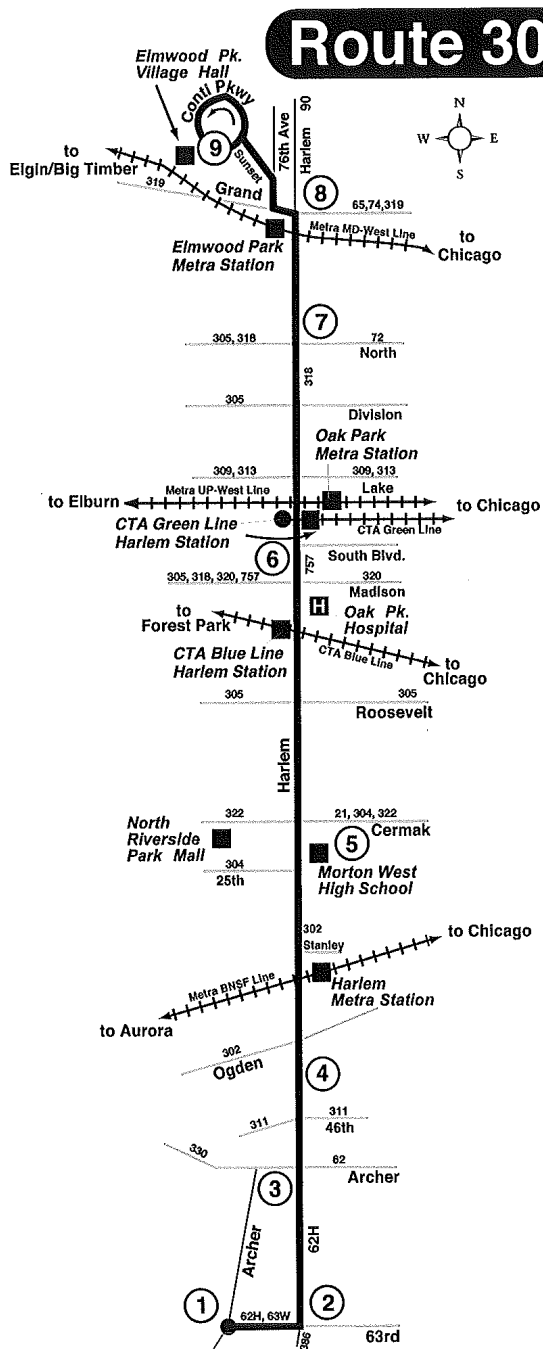
090309rp122309rev

Route 304

Effective Date
February 8, 2010

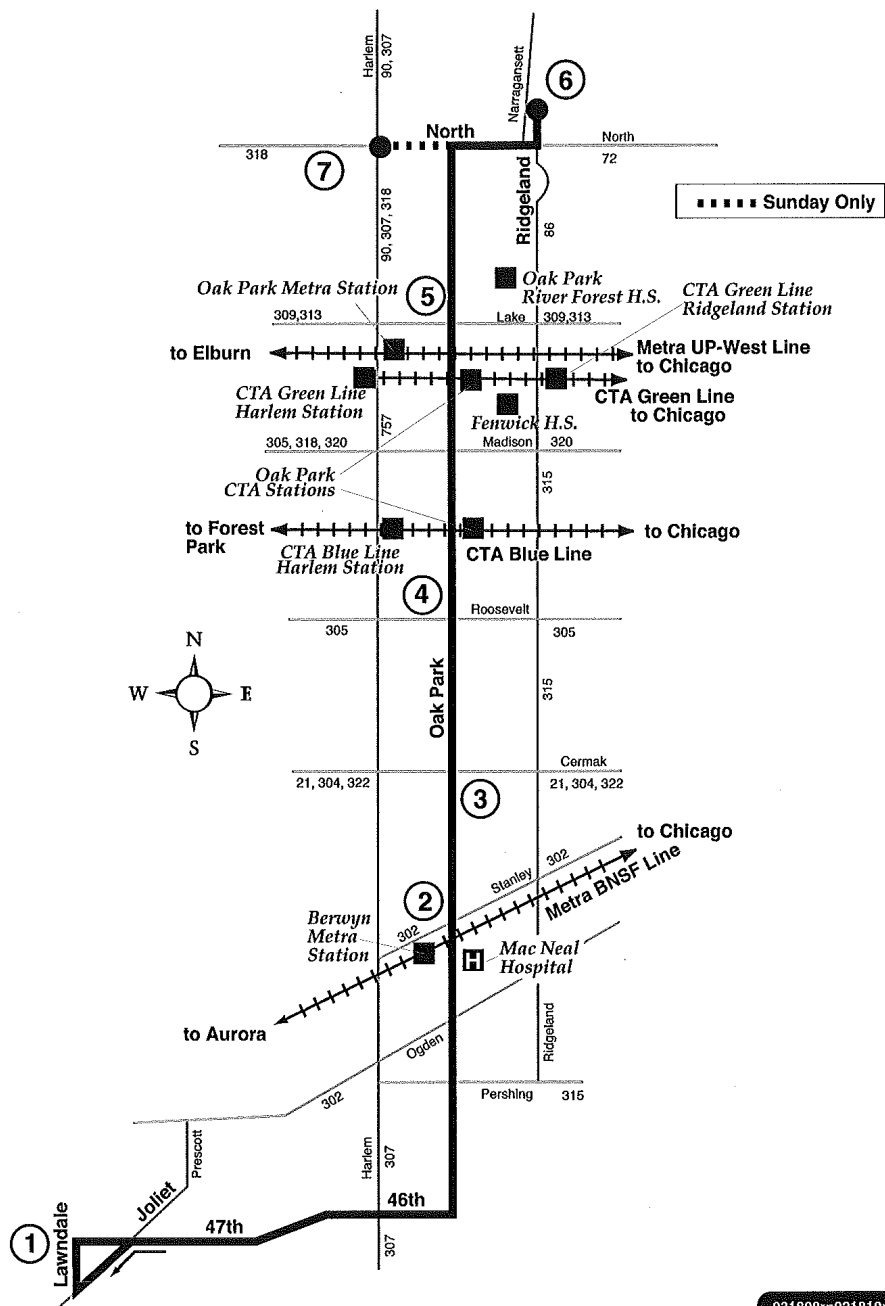






Route 311

Effective Date
November 19, 2006



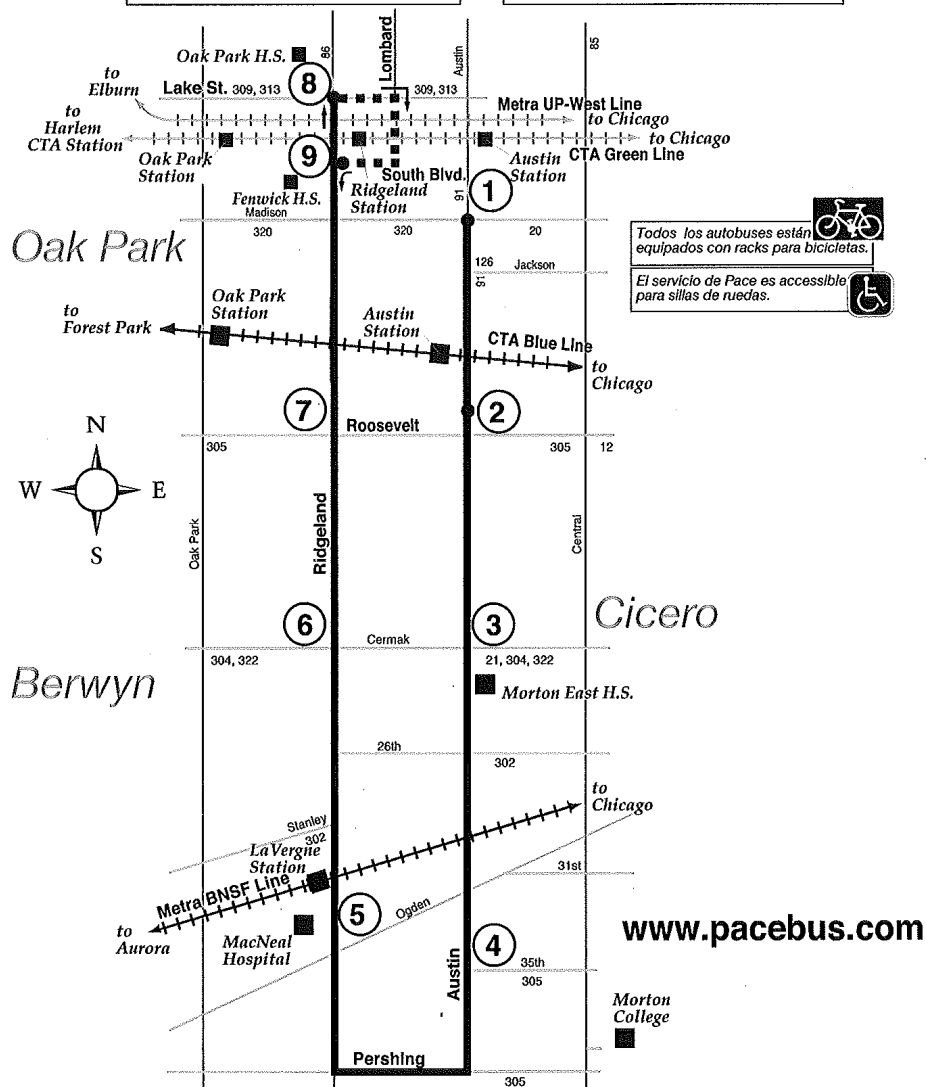
031809rp021810rp

Route 315

Effective Date
February 8, 2010

■■■ EASTBOUND trips operate via Lake - Lombard - South Blvd. - Ridgeland and then resume regular routing.

■■■ HACIA EL ESTE viajes operan via Lake - Lombard - South Blvd. - Ridgeland y después continúa la ruta regular.



In Cicero bus will stop only at streets and avenues (not courts and places). In other communities bus will stop on signal at any intersection where it is safe to do so.

En Cicero el autobús solamente parará por calles o avenidas (no en cortes o lugares). En otras comunidades el autobús parará por señal en cualquier intersección donde este seguro para parar.

www.pacebus.com

032310rp110910rp

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